THE Chemical Age

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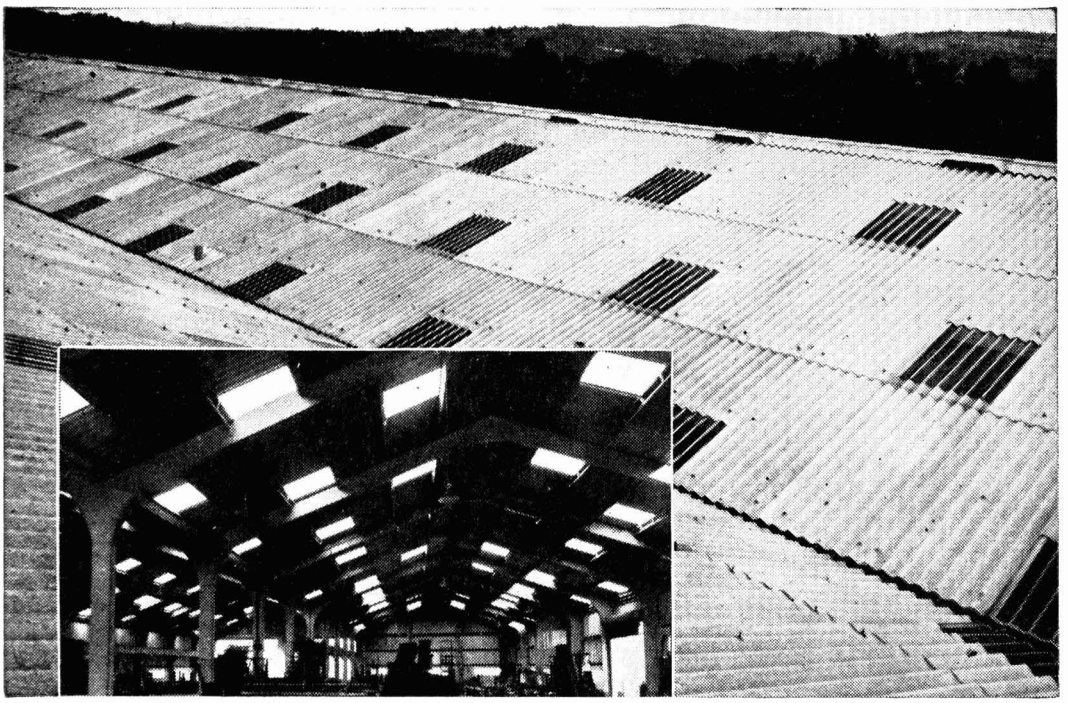

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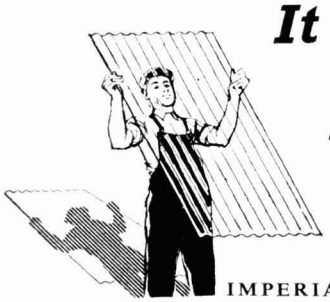

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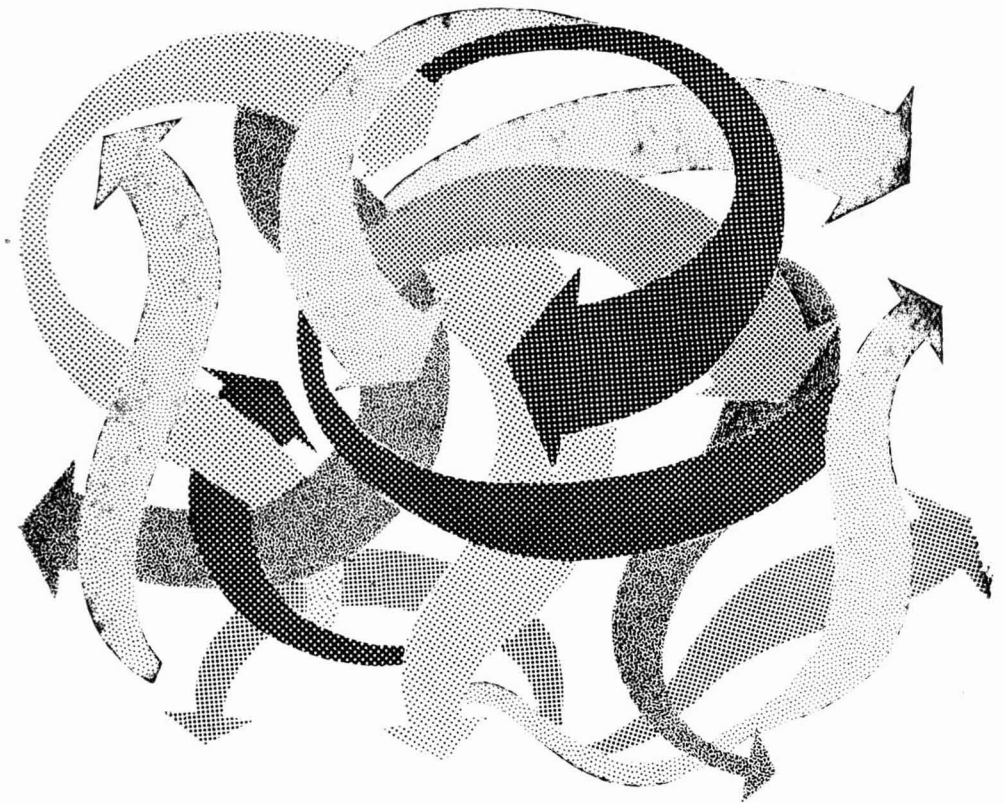

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Making Chemists

IT IS DIFFICULT to define the point when any boy or girl starts on the process of becoming a chemist. The first school lesson in chemistry may seem the obvious beginning, but it must be in very rare cases that the individual decides at that moment or even in that first year that he or she will one day be a chemist. In any case, such a judgment would always be more soundly arrived at after considerably more acquaintance with chemistry and also of other subjects; the very youthful liking for a particular subject may occasionally be soundly instinctive, but for most it must be crudely immature.

To define the point when the individual has actually become a chemist is easier. There may be much more to be learnt and certainly all that is termed experience still to be gathered, but for practical purposes the chemist has been made at the end of a three-years university degree course. If this stage is arrived at when the individual is older than, say, 21 or 22, the economics of becoming a chemist—at any rate by full-time training—are far from enticing.

In any case, it is not an unreasonable desire of human nature, especially in youth, to want to be earning as well as learning in the fairly early twenties, and when this point is given its proper consideration it becomes self-evident that proposals to lengthen the training period of chemists are likely to reduce the number of people who will choose to become chemists.

In short, we have a variable time-period for serious full-time learning. At some unknown point in the teens there is a decision that chemistry rather than any other subject will be the career-aim; from then until 21 or 22 the main task has to be accomplished. Yet the subject itself is far bigger than it was 20 or even 10 years ago, and both in this country and the United States there is a most serious shortage of good teachers; indeed, we are frequently told that because of this shortage little time is given to chemistry in many school curricula.

A pint has to be crammed into a half-pint—yet there are fewer people to cope with this problem than in the days when the problem of subject-volume and vessel-capacity was so much simpler.

Perhaps to some, this may seem an over-simplified statement of a problem now generally recognised. Frankly, we regard the elements of this problem as simple—indeed, as starkly simple. Equally, we feel that any statement of it which is less elementary tends to obscure its seriousness.

All problems have their attempted solutions, and in a problem such as this —which may well have no complete solution, whatever could be done about it—some attempts may be more harmful than beneficial. Obviously, the teaching of modern chemistry will differ from the teaching of chemistry in, say, 1925. There must be deletions to make up for the many new introductions; there must

be in the 1950s what teachers and students of the 1920s would regard as 'short-cuts'.

It seems to us highly important to decide the stage at which these time-economies should be made, and there seems far greater risk to the end-product if they are made in the earlier stages of learning chemistry. In short, trying to get the pint into the half-pint pot is far more a responsibility of later university teaching than of school teaching. At the university stage the embryo chemist's aptitude as a student should be greater; mental flexibility will be close to its natural peak in growth, and omissions or short-cuts should be more easily understood. Metaphorically perhaps, the universities always have received half-baked students for conversion into the completed product; but if in the school years, even at the sixth form level, much of the older, basic chemistry teaching is streamlined, with the descriptive approach shortened and over-all theories of classification speedily introduced, then the universities' intake will surely be more truly described as quarter-baked.

Two recent articles in the *Journal of Chemical Education* (1956, **33,** 390 and 391-2) justify these fears, even though one of these articles supports the cause of teaching chemistry against a background of principles or theories. To quote from the other article, which pleaded for a return to the older balance between descriptive and theoretical treatments: 'An examination of several, recently written, general chemistry text-books reveals a definite emphasis on the physical approach with a corresponding reduction in the space formerly devoted to a descriptive treatment of topics.'

An example is cited of one text-book of the 1950s which discusses atoms, atomic weights, isotopes, and Avogadro's number in the first 10 pages!

Most chemists now of middle-age will recall an approach to chemistry that—at any rate looked back upon now in retrospect—aimed at no more than gaining familiarity with chemicals as such, with chemical properties and chemical reactions. In terms of theories that bring chemical understanding, this approach was disorderly. But the simplifying background of the periodic classification was introduced at a stage when its importance could be fully appreciated, when—as in the history of chemistry itself—the need for a correlating principle had become pressing.

From that point onwards in chemical education the assimilation of other general theories or principles became both easier and stimulating. It is difficult to believe that short-cuts in this teaching process, with theories presented too soon and with a much shorter prelude of descriptive (and also, almost certainly, of practical) chemistry can produce better chemists.

Today, to quote again from one of the mentioned articles, in contrast to the mountainous growth of chemistry as a factual subject, 'theories have become more general in their coverage and offer many qualitative explanations which even beginning students can apply . . . they should appeal to students as a logical way to organise and correlate the many, seemingly unrelated facts with which they are confronted . . .'

Is it an unfair exaggeration to suggest that this outlook reduces chemical theories to the role of students' mnemonics? Chemistry is primarily a practical subject and it cannot be approached as an intellectual exercise in deductions and inductions. Perhaps because of this trend towards theory in chemistry teaching, the much deplored decline in analytical chemistry has developed; the electronic atomic diagram has become more important than the burette and the balance.

None of this commentary is intended to suggest that a more balanced descriptive and theoretical approach in learning chemistry will solve the 'pint-half-pint' problem. Unless the economic and human problems of lengthier chemical training can be overcome without dissuading youth from becoming chemists at all, this is a problem that must find its main solution in the post-graduate attitudes of young chemists—they must realise that they still have much to learn even though they have been put into a position of being able to earn.

NEWS BRIEFS

Eight Countries Bidding

Procon (Great Britain), refinery design and construction engineers, are bidding with seven countries for a £5½ million contract to build a new oil refinery in Syria. Three iron curtain countries, Russia, Czechoslovakia and Yugoslavia, are also competing for the contract for the new refinery, which will be at Homs and will have an annual output of one million tons.

Protamine Zinc Insulin

Following the results obtained with the Novo Lente insulins in this country, requests have now received by Evans Medical Supplies for other Novo insulin preparations. The manufacturers announce that Novo PZI is now available in packs of 5 ml., 40 units; 10 ml., 40 units; 5 ml., 80 units. The company has also reduced prices of the Novo Insulin (unmodified).

Anti-Polio Vaccine For NZ

On 15 August the first export of Glaxo anti-polio vaccine Polivirin left Gladstone dock, Liverpool, in the s.s. *Cambridge* for Wellington. It is expected that the New Zealand health authorities will be in a position to begin vaccination in about a fortnight after the arrival of the vaccine at Wellington, approximately 15 September. Sufficient vaccine has been exported to New Zealand to enable between 40-45,000 children to be vaccinated.

Damascus Trade Fair

ICI Ltd. are showing a wide range of chemicals, plant protection specialities and plastics as well as dyestuffs, fibres, leathercloth and paints at the third international Trade Fair at Damascus. The exhibits will show many of the results of the company's massive programme of research and development.

Dumping Duty on Chemicals

Notices have been issued under Section 4 of the Australian Customs Tariff (Industries Preservation) Act applying dumping duty to tetra methyl thiuram disulphide; zinc dimethyl dithiocarbamate; and zinc diethyl dithiocarbamate.

Greek Fertiliser Plant

Tenders for the construction of a nitrogen fertiliser factory at Ptolemais have been called for by the Greek Government. The plant is to be designed for an output of 70,000 tons of nitrogen annually. Only domestic raw material will be used. Cost is estimated at $25 million at least. The output of nitrogen fertilisers will be: sulphuric ammonia, 140,000 tons; calcic nitric ammonia, 140,000 tons; Urea, 6,500 tons, and anhydrous ammonia, 14,500 tons. It is considered that these quantities should more than satisfy Greek needs, and will be cheaper than imported fertilisers. A saving of over $17 million of foreign currency is estimated.

Plant Engineering

'Future Developments in Plant Engineering' will be the theme of the Incorporated Plant Engineers' southern regional conference at the Grand Hotel, Bournemouth, from 12 to 14 October inclusive. Full details can be supplied by Mr. W. R. Selwood, Chandler's Ford, Southampton.

Chemical Exports for July

LARGEST importer of chemicals from Great Britain during July was Australia with a figure of £1,695,982 as against £1,430,334 for June. The total value of chemical exports from this country amounted to £19,972,653, which was a slight decrease over the previous month's figure of £20,677,569.

It was stated in THE CHEMICAL AGE last week (see p. 299) that the Mexican chemical industry is expanding but that Mexico was still a large market for imported chemicals. In the last 12 months exports of British chemicals to Mexico have increased six-fold, from £13,297 to £83,603, the largest percentage increase recorded for any substantial importer.

A brief analysis of the export position for different commodities is given in the following table:—

Basic chemical elements and compounds, £4,295,474; Coal tar products, £581,712; Synthetic dyestuffs, £807,395; Paints, pigments and tannins, £2,149,192; Medicinal and pharmaceutical products; £2,931,210; Essential oils, perfumes, soaps, polishes etc.; £1,969,889; Fertilisers, £52,807; Plastics, £2,041,231.

Detailed figures of British exports can be obtained from *Accounts Relating to Trade and Navigation of the United Kingdom*, July 1956, published by HM Stationery Office, price 17s 6d.

ACS September Meeting

CHEMICAL advances against diabetes and cancer, progress in the cold sterilisation of foods, and the latest developments in automotive lubricants will be reported at the 130th national meeting of the American Chemical Society, planned for 16-21 September at Atlantic City, NJ, US.

Ten thousand chemists and chemical engineers from all parts of the United States and several foreign countries will participate in the sessions.

Papers to be presented will include:—

'The Impact of Chemistry and Chemical Engineering on the Production and Utilisation of Agricultural Commodities', by Byron T. Shaw; 'Patents and Pharmaceuticals' by Robert C. Watson; and 'Is Chemical Education Too Specialised?' by Dr. Warner (presidential address).

The use of radioactive materials to sterilise foods will be discussed in a symposium to be sponsored by the division of agricultural and food chemistry, and a symposium on air pollution will also be held.

Cynomel Introduced

THE INTRODUCTION of Cynomel is announced by Menley & James Ltd., Coldharbour Lane London SE5. Cynomel is the sodium salt of L-tri-iodothyronine and is sold in tablets of 5 μg. and 25 μg. Both sizes are available in packets of 100 and 1,000.

Cynomel is indicated in the treatment of metabolic insufficiency, manifested by physical and mental sluggishness, decreased emotional control and diminished function in various organs and systems.

Chemically closely related to L-thyroxine, Cynomel is metabolised at cellular level and is distinguished by a remarkably rapid onset and cut-off of effect.

Butadiene Plant Expansion

Goodrich Gulf Chemicals Inc. has announced a multi-million dollar expansion programme in plant facilities at Port Neches, Texas, which will increase the annual production of butadiene by 50 per cent to 300,000 short tons. Work on the project has already begun and some of the increased production will be realised late next year. Full production is planned for the autumn of 1958. The butadiene plant is operated by Neches Butane Products Co.

Reactor Conference at Harwell

THE United Kingdom Atomic Energy Authority is to hold a conference at Harwell on 30 November, 1956, at which its programme of research on advanced types of nuclear power reactor systems will be explained to representatives of British Industry.

Accommodation will be available for about 200 representatives from industry. Because of the limited accommodation available it will probably be necessary to limit the number of representatives from any given firm. Requests for further details and for reservations should be made to the Director (Industrial Collaboration Office), Atomic Energy Research Establishment, Harwell, Nr. Didcot, Berks, not later than 31 August.

Following this conference British firms wishing to do so may be kept informed of the general progress of work on these reactor systems. The information will be supplied at an annual conference on each system. Application for admission to this scheme should be made to the industrial collaboration office at Harwell, from whom further details may be obtained.

New Chlorine Bleach

A NEW FORMULATION of Ad-Dri bleach claimed to give improved results in the laundry washer is being offered by the industrial chemicals division of Olin Mathieson Chemical Corp., Baltimore, Md. The original Ad-Dri was introduced in 1951 as the first dry chlorine bleach for the commercial laundry field.

The new formulation, a hypochlorite product designed especially for laundry plant bleaching, is stable, free-flowing and fast-dissolving, and can be added dry to the bleach suds operation. An inorganic chlorine bleach, Ad-Dri releases its chlorine safely and quickly. It is not being offered for household use.

The material is shipped in 100 lb. lever-opening fibreboard drums. Each drum contains a clear polystyrene measuring cup which is calibrated in pounds of dry wash weight to permit easy measurement of the proper amount of Ad-Dri for the wash load.

Uranium in Turkey

Small quantities of ore containing uranium are said to have been discovered in the locality of Afyon.

NOTE & COMMENT

DETAILS of wide-spread poisoning by endrin, a newly introduced insecticide related to aldrin and dieldrin, were published in the *British Medical Journal* of 18 August (p. 393). Ten men at a works in South Wales were taken violently ill on 2 May, two having to be sent to hospital. Inquiries revealed that the only common factor was white bread rolls (baked at a local bakery) and tea, taken prior to the onset of symptoms. By the following day 47 further cases had been notified, all the persons involved having eaten bread made at the same bakery. It is estimated that at least another 100 people were affected by the bread, but were not ill enough to require medical attention. Thirty of the affected individuals had convulsions resembling those of epilepsy, falling to the ground unconscious wherever they happened to be. Unconsciousness lasted for periods of up to half an hour. The majority of the victims recovered rapidly but a few were off work for up to a month. Investigations revealed that the outbreak was due to contamination of the flour from which the rolls and bread were made by endrin which is a recently imported US insecticide used for controlling apple aphis, apple sucker, winter moth caterpillar, tortrix caterpillar, and apple sawfly. It appears that a consignment of endrin dispatched on 20 February leaked 3 gallons into the conveying railway goods wagon during transit. The same wagon conveyed empties between 20 February and 25 April, and on this latter date was loaded with 100 sacks of flour at Cardiff and dispatched to Swansea. Two sacks absorbed endrin from the vehicle floor and were the ones delivered to the bakery. On the morning of 2 May, the baker had returned two sacks of national flour because of an indefinable odour. Examination of the floor of the bakery storeroom on 7 May revealed that where a sack of national flour had rested there was an aromatic odour. The sacks returned by the baker were traced and on examination an aromatic odour was noted at the bottom of the sack.

Difficult Analysis

THE GOVERNMENT CHEMIST reported that after a long and difficult analysis, the contaminant had been identified as endrin, which was present in some parts of the flour to the extent of 5,500 parts per million. Endrin was recovered from some parts of the bread consumed to the extent of 150 parts per million. Samples of the wagon floor on analysis on 8 June showed endrin still to be present in one section to the extent of 116,000 parts per million. Endrin is dissolved in xylene for normal spraying purposes and spillage into the wagon had occurred at a concentration some 800 to 1,600 times higher than that at which it was sprayed in the fields. Under normal conditions xylene evaporates fairly quickly. The manufacturers recommend suitable precautions with regard to endrin while emphasising its toxicity to be of a lower order than that exhibited by the older phosphate insecticides or by arsenic compounds. Acute oral toxicity of endrin to small laboratory animals is, however, greater than that of aldrin or dieldrin . . . There is apparently no literature concerning human endrin poisoning and this *British Medical Journal* report must be regarded as the first.

More Precautions Needed

HAVING REGARD to the data concerning aldrin and dieldrin poisoning, it would seem that greater attention should have been given to transport of containers of endrin and to the satisfactory nature of the containers themselves. It is surprising, too, that complaint does not appear to have been lodged regarding the loss of 3 gallons. It would be of interest to learn whether any special transit instructions were given because of the poisonous nature of high concentrations of endrin. It is considered that spillage would be noticeable because of the aromatic odour of the xylene and the 'medicinal' smell of the endrin itself. Careful labelling of the containers would also

call attention to the dangerous nature of the contents, and ensure that in any case of leakage appropriate action could be taken. It would seem wise, also, to reserve wagons to be used only for transporting chemicals, insecticides and other dangerous substances, and that foodstuffs should be loaded only on wagons kept for the purpose.

Food Technology

PROBABLY no accounts of DSIR research are as diversified in topics as each year's reports from the Food Investigation Board. The new Report for 1955 (HMSO, 4s 6d) is no exception. Detailed chemical and biological research rubs shoulders with simpler practical studies of packaging, transport, etc. A large proportion of the Board's work is concerned with food's perishability. All but trivial amounts of our diet is inevitably perishable and science must aim not at reversing the tides of natural decay but at reducing their speed.

An interesting chemical topic is the use of alcohols to suppress sprouting of potatoes in storage. Several seem to have practical possibilities—normal amyl alcohol, active amyl alcohol, tertiary amyl alcohol, iso-amyl alcohol, and nonyl alcohol. All the first four were effective, but nonyl alcohol, readily available in bulk, was effective at a much lower concentration. Everything points, therefore, to the choice of nonyl alcohol for official recommendation. Not always is the best material on test evidence also the one that is easily available. At the same time, however, this prospective chemical development is threatened by an 'atomic' method for sprouting control. Low doses of radiation appear 'to be one of the most promising potential applications yet described.' There may be incidental problems in developing this other method: tests have shown that irradiated potatoes, though prevented from sprouting, develop poor cooking quality, poor texture, and high sugar content after four months' storage.

Fish-Preserving Agents

USE OF ANTIBIOTICS as fish-preserving agents has had continued study. Aureomycin at five parts per million in ice extends the fresh-life period by eight to 10 days. It is stated that large-scale trials of various 'bacteriostatic ices' are to be organised. The problem of residues is being left for future assessment. This seems a wise course. First, the real value of antibiotics as ice additives will be clearly established, and not before then will the vexed problem of using therapeutic substances in large-scale food handling be referred to medical opinion. Unfortunately antibiotics not in medical use are ineffective against the organisms that reduce fish quality.

A simpler practical subject—keeping fish boxes clean—has chemical implications. Owing to the porous nature of wood and the heavy bacterial contamination involved, there is no practical method of cleaning, other than scrubbing plus the use of a strong disinfectant (1,000 parts per million of chlorine or an equivalent quaternary ammonium compound). The surface-coating of wood with resins has made boxes easier to clean and has also reduced the rate of bacterial contamination, but the latter effect cannot eliminate any of the need for disinfectants and scrubbing. It would seem, therefore, that the substantial market for disinfectants in fishing ports is unlikely to suffer a decline through technical competition.

Scottish Plastics

CALEDONIAN FIBREPLAST LTD. is a newly registered Scottish company which will manufacture reinforced plastic goods in the Edinburgh area. Headquarters are at Gogar House, Glasgow Road, Edinburgh. Principal of the new company is Sir James Steel-Maitland.

The reinforced plastic industry has grown slowly in Scotland but it is hoped to establish it firmly with a view to meeting demand for lightweight materials in a variety of industries.

Geelong Dredging Project

Work has begun on a £A1.6 million dredging operation at Corio Bay, Victoria, Australia, to make the port of Geelong suitable for access by the largest oil-tankers which will serve the new oil refinery set up there by the Shell Company. Work is expected to be completed by 1958. To pay for the project, the Geelong Harbour Trust will impose a levy on each tanker entering the port.

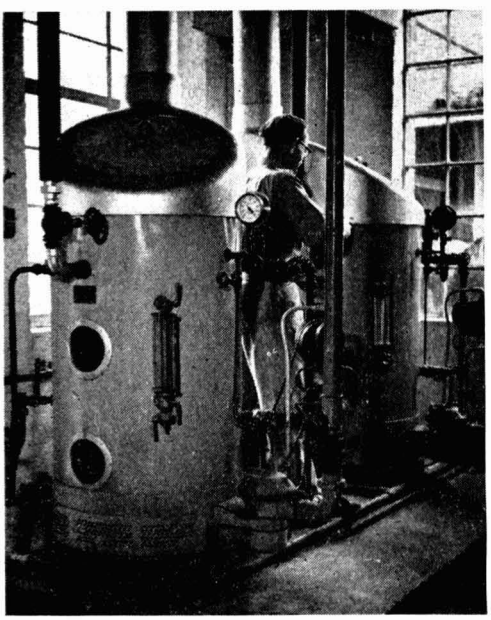
PRINTING INK MANUFACTURE

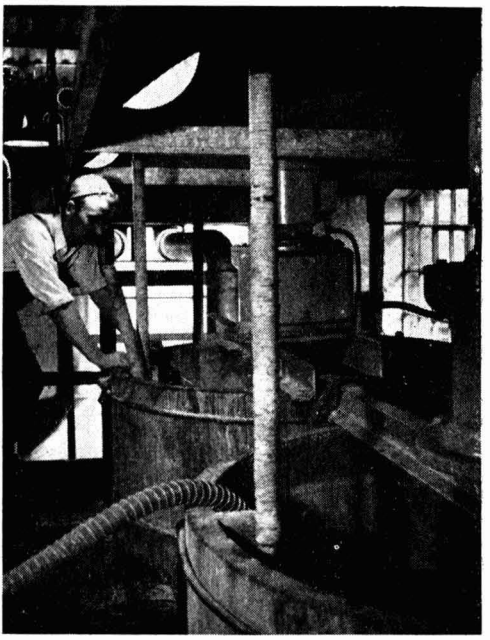
Dane & Co's Research Programme

THE introduction of fluorescent materials has been largely responsible for accelerating the recent research programme of Dane & Co. Ltd., a privately-owned company established in 1853 to manufacture printing inks. Next month the company is opening a new factory at Blackheath to accommodate new developments.

Versatility appears to be the keynote of this firm. In an area of 80,000 crowded sq. ft. at Stratford, London, it conducts a surprisingly wide range of activities. In addition to printing inks, it produces varnishes, silk screen process colours and equipment, display colours, artists' water poster colours, marbling colours and equipment, dry colours, oils, waxes, Day-glo colours, and various sundries for the printing and allied trades.

Thirty years ago, Dane & Co. Ltd. started to produce silk screen printing inks. Today, the company claims to manufacture by far the largest proportion of all screen printing inks in this country. In the last five years, the research staff has developed Day-glo fluorescent colours, manufacturing them under licence to Switzer Bros. Inc. of the US, and supplying them to all countries outside the US and Canada.





Two scenes at Dane & Co's works in London. Above, mixing Day-glo pigment in wooden vats. Below, a battery of gas heated cooking pots

Other fluorescent materials, responsive to ultra-violet light, are used for the non-destructive detection of cracks and defects in metals. Their development as crack-detectors in engineering was carried out by the research staff in conjunction with the Magnaflux Corporation of the US, which is also a licensee of Switzer Bros. One of these materials, named Zy-glo, is a fluorescent penetrant fluid widely used in aircraft construction and maintenance and in many other industries, including chemical engineering. Zy-glo has been developed during the past year and is just going on to the market.

The research and control staff, which totals 15, is directed by Mr. T. N. Gaunt, B.Sc., A.R.I.C., the technical manager, who graduated from Leeds University with first class honours in 1944. Mr. Gaunt, who serves on the technical committee of the Society of British Printing Ink Manufacturers, told THE CHEMICAL AGE that the

laboratory's work falls into three main groups.

As many orders received by the company are for non-standard materials, e.g. inks of different shades or inks that dry slower or faster than existing products, the laboratory spends considerable time preparing formulations, many of which are suitable modifications of existing materials. Much of this work is done by skilled technicians. Some 60,000 or 70,000 formulations are in current use. Asked how many new formulæ were developed each day, Mr. Gaunt said that 'a very conservative estimate' would be 12.

The second function of the laboratory is quality control. Pigments are tested for shade, strength, fastness to light, oil absorption, bleeding in various solvents, and alkali or acid resistance where applicable. Pigments not up to standard are rejected. Varnish and synthetic resins are tested for viscosity, drying rate, and melting point. The laboratory also checks that the chemicals involved, such as formaldehyde, conform to normal specifications. Finished inks are checked against original samples for colour strength, permanence, drying rate and printing properties.

The third function of the laboratory is the long-term development of new products. When a radically different type of material is sufficiently developed in the laboratories it is sent out for a trial in a customer's factory. After a report has been received on the material and any necessary modifications have been made, it is sent out again to a number of different factories for

PRINTING INK

further trials. Only when these further trials have proved the material to be entirely satisfactory is it finally put on the market.

Mr. T. Thorne Baker, F.C.S., F.Inst.P., A.M.I.E.E., F.R.P.S., formerly director of research and now consultant to the company, was largely responsible for setting up the research organisation. Close contact in research and development activities is maintained with Switzer Bros. and regular visits are exchanged by members of the two companies. An indication of the success of this Anglo-American co-operation is a list of 21 patents granted or pending. Six of these have been developed by Dane in the last four years.

Originally Day-glo faded fairly quickly. The laboratory staff, faced with the problem of increasing the fastness to light, treated fine particles of synthetic resins with dyestuffs. By the development of novel types of synthetic resins the fastness to light was increased over six times. These synthetic resins were specially designed for this purpose and new dyestuffs were synthesised for use with them.

A department for the manufacture of these novel synthetic resins was designed by Mr. M. A. Cochrane, the company's resins chemist. Mr. Cochrane, who has had many years experience of synthetic resins in the US, Africa and the Far East, told THE CHEMICAL AGE that he planned the new department because few synthetic resin pro-

The millroom showing triple roller mills. A film of paint is running from the mill in the centre of the room

MANUFACTURE

ducers cater for printing ink manufacturers.

A further development was the manufacture of synthetic resin pigments of very fine particle size—one micron. The ease of wetting by oils was greatly improved enabling Day-glo to be used in letterpress printing. Originally a film of Day-glo colour three thousandths of an inch thick was necessary to obtain proper brightness. With new materials, good colour strength is now obtained from films only 1/10 thousandth thick.

Day-glo paints are said to be visible at a distance three times that of ordinary colours. They are therefore of particular interest to military authorities for signalling purposes, and are used widely by the RAF, in the form of fabric coatings, for dinghies and aircraft markings. Another use is in chalk.

Screen inks suitable for application to nearly every type of surface, such as plastics, metal and glass, are produced. The company has also developed high gloss silk screen printing inks with quick drying speeds. Cellulose based inks, not having the odour and fire risks normally associated with nitrocellulose, have also been developed.

An interesting aspect of the firm's activities is the supply of technical 'know-how' to firms in Ireland, South Africa, Italy, Australia and New Zealand. These firms manufacture under licence to Dane.

The company is still in the hands of the same family after 103 years. The chairman is Mr. A. D. Dane and his brother, Mr. G. W. Dane, is also a director. Mr. G. D. Dane, the chairman's son, was responsible for negotiating the agreements with Switzer Bros. and the Magnaflux Corporation. He is also the president of the Society of British Printing Ink Manufacturers.

An atmosphere of cordial relations between the staff and management is readily apparent to the visitor and one imagines that this must be a firm that seldom suffers from the industrial disputes which are so prevalent in this country today. This impression seems to be borne out by the high proportion of the staff who have been with the company over 40 years. Mr. L. W. Harrison, the general manager, told THE CHEMICAL AGE that among the company's former employees now on pension are four men who had 50 years' service with the company and one man who had 58 years' service.

Some of the suppliers of equipment installed at the company's works are:—*triple roller mills*: Torrance & Sons Ltd., Marchant Bros. Ltd., Cox Bros. Ltd., Holmes Bros. Ltd.; *varnish plant*: Winter & Sons Ltd., Aluminium Plant & Vessel Co. Ltd.; *mixers*: Barker & Aspey; *ball mills*: Steele & Cowleshaw, Rochester Welding Co. Ltd.; *grinding equipment:* Bramigk Ltd.; *kek mills*: Kek Ltd.; *cooking pots*: Metal Propellers Ltd., North Thames Gas Board.

US Companies' Link-Up

CARY CHEMICALS INC., have announced completion of a contract with the Scientific Design Company, Inc., also of America, and its subsidiary, SD Plants, Inc., for the design and construction of a new p.v.c. resin plant, to be completed next spring at Flemington, New Jersey. It is the first such plant for Cary Chemicals and the sixth p.v.c. project undertaken by SD. The plant will employ SD's suspension polymerisation process to produce resin with outstanding electrical properties. A substantial part of the plant's 12 million pounds annual output will be for captive use to make p.v.c. compounds for sale to the wire and cable industry, one of Cary's principal markets. The balance will go into other Cary products or to other p.v.c. compounders. Cary's have not previously manufactured any part of their resin requirements.

Solves Atom Mysteries

AMERICAN progress in tackling a number of mysteries in both the peaceful and military uses of the atom over the last six months has been particularly striking, the US Atomic Energy Commission's semi-annual report reveals. The US is now the non-communist world's leading producer and its uranium ore production has reached nearly three million tons a year. This was expected to reach five or six million tons a year, compared with 1948 production of 70,000 tons. Regarding the peaceful application of the atom the Commission disclosed that it had gained important information as a result of an accident at its Argonne experimental breeder reactor last November. Now scientists have discovered that the heat reached in the reactor core exceeded 1,130°C which fused uranium fuel rods with various parts of the core.

East German Chemicals

New Production Plant

DURING the next five years, new production plant will be set up at the Leuna-Werke Walter Ubricht at a cost of a half million DM (almost 2.2 per cent of the total capital investment of 23 milliard DM forseen for East German industry in the Five-Year Plan 1956-1960.

Priority in new plant and research is being given to Leuna synthetic motor fuel production. The present process for manufacturing synthetic petrol and diesel fuel has been used since 1928, but the quality of the fuel produced is below the present international standard, particularly in octane value.

By-product gases of hydrogenation, which until now have been used only in the manufacture of synthetic lubricating oils, will now be used in the preparation of synthetic resins particularly polythene. Epoxy coating resins will also be produced and Leuna-Werke hopes to supply a suitable 'pressing' compound for the East German gramophone record industry.

A new activity for this company will be the manufacture of non-ionic detergents.

Dr. Schirmer, the general manager of Leuna-Werke, discussing these plans, indicated that owing to lack of experience in the expansion of gas units and the extension of high pressure reaction space, East German chemical plant manufacturers may encounter difficulties. He was also concerned about the East German planning commission's preclusion of new machine tools for the chemical industry.

An overall increase of 15 to 20 per cent above the 1955 level has been set under the new Five-Year Plan for the VEB Chemische Werke Bima at Schkopau. In particular, outputs of polyvinyl chloride and of the primary material for the acrylic fibre, Wollcrylon, are to be increased and new, especially impact-resistant, varieties of polystyrene and other synthetic resins will be developed.

Synthetic rubber production is to be raised at least 20 per cent by 1960. The output of textile auxiliaries is to be increased and the manufacture of solvents and lacquer components is to be started.

Output targets have been set for 1956 as follows: Calcium carbide, 560,000 tons; sodium lye, 70,000 tons; buna, 75,000 tons and polyvinyl chloride, 26,000 tons.

Heat-Resistant Lubricants

INVESTIGATORS REPORT good progress in the search for high-temperature aircraft lubricants that will operate between 538°C and 1076°C, that is, more than three times hotter than existing lubricants. Dr. Donald F. Wilcock of Schenectady, NY, US, has said (*Jour. Franklin Inst.*, 1956, **262**, 89) that while there are metals which will function up to 1076°C, there is no fluid lubricant available that can be used at this temperature. The upper limit in aircraft hydraulic systems is around 260°C and around 177°C in bearings. The silicone oils can be used at temperatures of 316°C, at the most 371°C.

A new lubricant fluid has been found, however, which in laboratory tests, is stated to give efficient lubrication at temperatures approaching 1076°C. Further development will be needed, for some of the compounds have such a high boiling point that they will actually freeze at temperatures of about 200°C. This is the temperature range where some present lubricants boil.

Research workers are hoping to develop stable high boiling molecules so that the lubricants will be fluid at lower temperatures, and have the 'oiliness' characteristic necessary for many vital applications. Other advantages would be ease of handling and the simplification of design.

Chemical Fuels

Temperatures of up to 5,700°C. are stated to be obtainable with the aid of carbon subnitrides. Such high temperatures, it is believed, would give rise to new types of chemical manufacturing processes and new products. The subnitrides may also have applications in rocket fuels. At the present time very small quantities of these compounds are only available for laboratory investigations, but the possibilities of producing greater quantities is being studied in US.

New Refinery to be Built

Because of alleged pollution of the atmosphere, the Belgian Purfina refineries at Milan and Rome are to be dismantled and negotiations are now in progress for the construction of a large new refinery to replace them. The new refinery will be built at Maccarese, on the coast about 20 miles north of Rome and will have a capacity of about 2.5 million tons of crude oil. Owners will be Purfina and the Italian state-owned oil corporation, Eni.

PEOPLE in the NEWS

● MR. DONALD A. BENNETT has been appointed general manager of the International Synthetic Rubber Co. which has been formed by Dunlop in partnership with the Goodyear, Firestone and Michelin companies in Britain to make general purpose synthetic rubber on a large scale for the first time in the UK. Mr. Bennett, who is 35, was previously works manager of the plastics group of factories of The Distillers Co. Ltd.

● MR. H. WILMOT, C.B.E., chairman and managing director of Beyer, Peacock & Co. Ltd., has been elected chairman of the British Institute of Management in succession to MR. H. F. SPENCER who is retiring after the customary period of two years. In recognition of his services Mr. Spencer has been elected a life vice-president of the Institute.

● MR. T. E. DANIEL, M.ENG., M.I.E.E., M.I.MECH.E., chairman, North Western Electricity Board, has been nominated president of the North Western Fuel Luncheon Club for 1956-57.

● DR. ZAY JEFFERIES, a former vice-president of the General Electric Co. and a past-president of the Amercian Society for Metals, has been appointed director general of the second world metallurgical congress, to be held in Chicago, Ill., from 2 to 8 November 1957. PROFESSOR KINGSLEY W. GIVEN, professor of speech, Kansas State College, has been appointed assistant to the director general, and MR. W. H. EISENMAN, secretary of the American Society for Metals, has been appointed general secretary of the congress.

● News comes from the Stanford Research Institute, of Menlo Park, California, US, regarding the advancement of three executives to new posts within the organisation. DR. WELDON B. GIBSON, director of economics research, this week assumed new duties as associate director and vice-chairman of the management and operations committee governing SRI's administration and policies. MR. PAUL L. LOVEWELL, assistant director of economic research, has been appointed to the directorship held by Dr. Gibson. MR. WILLIAM J. PLATT, assistant director of economics research, has been given increased responsibilities for maintaining research quality, long-range planning of research programmes, and staff development and utilisation within the division. Economics work in SRI's Washington, DC, and southern California offices will also be under his direction. The Institute has further announced MR. PAUL J. LOVEWELL, assistant director recently took up the appointment of manager of SRI's new Hawaii office. MR. MAGILL replaces MR. WILLIAM E. HOSKEN, who is to undertake a key position in the Institute's work in the field of energy economics at the Menlo Park headquarters.

● DR. F. H. BANFIELD, director of research of the British Food Manufacturing Industries Research Association, has been elected Fellow of the Royal Society of Health in recognition of his outstanding work for public health. The Association's laboratories are at Leatherhead in Surrey.

● DR. E. HARRISON has been appointed head of the patents department at ICI, Hexagon House, in succession to DR. N. W. CUSA who has been transferred to the pharmaceutical division.

● MR. J. DEE SHAPLAND, B.Sc., A.C.G.I., A.M.I.Chem.E., has been appointed to the board of directors of Foamite Ltd. (manufacturers of fire fighting equipment) as technical director. Additionally, Mr. Shapland becomes chief chemical engineer to the parent company, Tecalemit Ltd., Plymouth. During the last five years of his service with Foamite Ltd., Mr. Shapland has been principally concerned with the development of foam systems of fire fighting, mainly concentrating on refinery protection and the development of crash tenders.

Mr. J. Dee Shapland

People in the News

● DR. A. F. WELLS has been awarded the degree of Sc.D. by Cambridge University. After graduating in chemistry at Oxford, Dr. Wells moved to Cambridge where he carried out post-graduate work in X-ray crystallography for which he received a Ph.D. degree. During the war he worked for three years in the Government service at Birmingham University and in 1944 joined the dyestuffs division to study problems in crystal growth. Dr. Wells is now in charge of the X-ray and crystallographic section of the physical chemical division of the research department.

● British Oxygen Co. Ltd. announce the award of fellowships for post-graduate research to MR. C. M. GEORGE, B.Sc. (Bristol University) for research in the Department of Chemistry, Bristol and MR. N. G. PARSONAGE, B.A. (New College, Oxford), for research in the Inorganic Chemistry Laboratory, Oxford. Renewal of fellowships for a third year has been granted to MR. B. F. FIGGINS, B.Sc., at Queen Mary College, London University, MR. D. H. KIRKWOOD, B.A., in the Department of Metallurgy, Cambridge University, and MR. R. D. MCCAMMON, B.Sc., at the Clarendon Laboratory, Oxford University.

● DR. G. WATTS PADWICK of the central agricultural control of Imperial Chemical Industries Ltd. has been appointed a director of Plant Protection Ltd. The appointment takes effect on 1 September 1956. Dr. Padwick joined ICI in 1935 as a plant pathologist. From 1937 to 1944 he was imperial mycologist to the Government of India. He rejoined ICI in 1946 and has been concerned with overseas development work on fertilisers and plant protection chemicals. Dr. Padwick takes the place on the board of Plant Protection Ltd. of MR. F. W. SUGDEN who is retiring.

● MR. JOHN W. GENDRON of Tidewater Oil Co., has been elected president of Iricon Agency, in succession to MR. R. S. STEWART, vice-president of the Standard Oil Co., of Ohio. Iricon is the organisation established to represent the five per cent interest in the Iranian Consortium held by American Independent Oil Co., Atlantic Refining Co., Getty Oil Co., Hancock Oil Co., Richfield Oil Corp., San Jacinto Petroleum Corp., and Signal Oil & Gas Co., as well as Standard of Ohio and Tidewater. Other elections to the Iricon Agency include:—MR. L. C. BERGQUIST, of Iricon's London office, vice-president; MR. DAVID E. DAY, of Richfield, vice-president; MR. J. J. SHREWSBURY, of Hancock, treasurer; MR. S. K. MCCAULEY, of Atlantic, assistant treasurer; MR. RAYMOND W. ICKES, of American Independent Oil Co., assistant secretary. MR. BENJAMIN TYRAN, of American Independent, and MR. JOHN K. SCHEMMER, of San Jacinto, have been elected to the Iricon board.

● First British research scholar to go to France under the auspices of the Franco-Pharmaceutical Commission, MR. K. H. PALMER of Retford, has been honoured with a Doctorate of the University of Paris. He has been awarded a fellowship for one year in the Department of Organic Chemistry in the Pure Chemistry Division, National Research Council of Canada.

● MR. C. N. KINGTON, M.B.E., B.Sc., M.I.Mech.E., M.I.E.E., has resigned as group manager, British Iron and Steel Research Association's Sheffield laboratories, director of research, Cutlery Research Council, and research superintendent, File Research Council. Next month he becomes chief mechanical and electrical engineer to Husband & Co., consulting engineers and architects, of Sheffield, London and Ceylon.

● It is announced by the Society of Leather Trades Chemists that the Seventh Proctor memorial lecture will be delivered by DR. G. W. KERNER, M.Sc., at the University, Leeds, on 21 September during the annual meeting of the Society. Dr. Kerner will discuss 'The Present and Future Scope of Peptide Synthesis.'

● Recently returned from a visit to research establishments in Canada and the United States is DR. I. G. C. DRYDEN, deputy director of basic research at the British Coal Utilisation Research Association. At the beginning of his tour Dr. Dryden visited Crystal Cliffs, Nova Scotia, where he attended the third conference on the Origin and Constitution of Coal. Following the conference Dr. Dryden visited a number of research establishments in the United States. He was also invited to attend the Gordon Conference on Coal, held at New Hampton.

Counter-Current Ion Exchange Process

Developed by Australian Scientists

Normally, before applying ion-exchange techniques to a liquid, it is necessary to filter off all suspended solids which might otherwise clog the resin. In many industrial applications, e.g., hydrometallurgy, this filtration accounts for a considerable proportion of the operating costs. This article, based on an article by E. A. Swinton and D. E. Weiss 'Extraction from Slurries by Ion-Exchange Resins' in the 'Australian Journal of Applied Science', (1956, 7, 98), describes how by pulsating the flow it is possible to apply ion-exchange techniques without previous filtration.

A CONTINUOUS counter-current ion-exchange process has been developed by the authors, both of whom are employed by the Division of Industrial Chemistry, Commonwealth Scientific and Industrial Research Organisation, Melbourne, Australia. The free passage of a suspension through a virtually compact bed of resin is achieved by pulsating the flow. The resin bed is alternately slightly expanded and then recompacted and is in a state of 'teeter'.

Each pulsation opens the bed sufficiently to allow the suspension to move a short distance during the forward stroke, but the duration of the expansion is too short for turbulence to develop in the bed. Pockets and channels are eliminated and blockage of the screen which retains the resin is prevented. Pulsated downflow and pulsated upflow operations have been investigated.

The 'pulsated' ion-exchange equipment differs from the conventional equipment in several important features. The resin is retained in the column by a 36 mesh screen or a graded bed of sand resting on a coarser screen. The section below the screen has a rubber diaphragm attached to its base, which is reciprocated by an eccentric.

Downflow Procedure

In the downflow procedure the suspension to be treated is fed through an open standpipe into the top of the column and leaves through an offtake just above the diaphragm. The procedure for upflow is similar but with inlet and outlet reversed. The restriction on the rate of upflow imposed on conventional processes by the low density of the resin is overcome by placing a retaining screen just above the bed. Blocking of this screen is prevented by the pulsations.

Attrition and fracture of resins in a pulsating bed could be significant but preliminary work indicates that the amount is not likely to be very great.

The following points were investigated in the CSIRO laboratories:—

(i) The upper limit of pulp density that can be treated.

(ii) The effect of pulsations on backmixing, wall channelling and turnover of bed as compared with the behaviour of a conventional static bed.

(iii) A possible loss in exchange efficiency through the enforced use of exchange resins of larger bead sizes.

(iv) A comparison with conventional practice of the pulsated upflow technique on an actual uranium leach pulp.

The variation of optimum flow rates with pulp density has not been investigated.

An experimental resin, Amberlite XE-123, made by the Rohm & Haas Co., US, was used in the investigations. This resin has a size range of 20-50 mesh but is less highly crosslinked than the similar Amberlite IRA-400. Stainless steel screens of 36 mesh were used.

It was found, by investigations on supensions of uranium ore pulp, that pulp densities of up to 40 per cent by weight could be passed. A 35 per cent pulp was passed through the column for 60 hours without causing any appreciable change in the pressure drop across the column. At the end of this period the pulsations were stopped and within three minutes the flow had dropped almost to zero.

A 35 per cent pulp was passed through a bed five ft. deep in a 12 inch column without any difficulty.

Experiments were undertaken to investigate the effect of pulsations on the passage of liquid through a teetering bed of resin dissociated from any effects of the ion-exchange reaction. It was concluded that any increase in channelling at the walls or in bed turnover caused by the pulsations, was either insignificant or was compensated by an increase in efficiency within the bed.

A direct comparison was made between

Ion-Exchange Process

the performance of a conventional column of ion-exchange resin, adsorbing uranium from a filtered leach liquor of a uranium ore in the conventional manner, and an upflowing pulsated column with ore pulp passing through the same bed. Results indicate that the pulsated pulp run was more efficient than the conventional run with the same coarse resin. In a conventional run with finer resins, breakthrough would have occurred much later because of the greater capacity of the resin.

The authors conclude by saying that the experiments demonstrate that the pulsated upflow technique for passing a finely divided suspension through a bed of ion-exchange resin is technically feasible and simple, and that its efficiency is little different from that of the standard technique using a clear solution through a bed of the same resin. A pulsated downflow technique is, in some applications, of equal promise.

Since the coarser resin must be used with the 'resin-in-pulp' process, considerable reductions in resin loadings are inevitable as compared with the standard process, and shorter cycle times must be used. A greater volume of resin and standard cycle times could be used as an alternative.

Since little free space is required above the top of the bed, as the backwashing operation of the conventional plant is eliminated, the extra volume of resin could be contained in a column of the same dimensions as the plant. This reduction in bed loading, which may well be offset by further improvement of the resin, is considered to be unimportant compared with the savings incurred by the elimination of a filtration plant.

It would be possible to modify an existing ion-exchange column by fitting an external pulsator unit and the requisite screens or filter beds.

The experiments show that the use of pulsated flow will not result in gross inefficiencies due to liquid channelling and turbulence within the bed.

Brazilian Insecticide Imports

Brazil has announced a number of alterations in the classification for import purposes of insecticides, and chemicals for the production of insecticides.

Portugal's Fertilisers

PLANS to permit Amoniaca Portugues at Estarreja, to increase its production of sulphate of ammonia from the present 25,000 tons to 70,000 tons annually have been approved by the Portuguese Government (THE CHEMICAL AGE, 28 July). The Government is to invest Escs.120 million in the work which should be completed by 1958.

Portugal's production of nitrogenous fertilisers has increased greatly since the factories at Estarreja and Alferradede (the latter having an annual capacity of 70,000 tons) went into production in 1951 to 1952, but domestic output is still only sufficient to satisfy half the country's requirements.

Output of these two factories is dependent on the availability of a sufficiency of cheap electric power. Last year, with 300 million kW available, they produced 80,000 tons of sulphate of ammonia. By 1958 it is estimated that production will have risen to 140,000 tons. Even this is insufficient for present requirements, which for 1955 amounted to 150,000 tons.

Irradiated Diamonds

DIAMONDS irradiated inside a nuclear reactor are coloured green and subsequent heat treatment may change the colour to brown. They also become temporarily radioactive, but this radioactivity decays to insignificance within a few days. Radiation from a particle accelerating machine, may induce a blue or blue-green colour. Irradiation does not affect the hardness of diamonds.

The United Kingdom Atomic Energy Authority now state that they will accept requests for the irradiation of diamonds as far as other demands on the available irradiation facilities permit. Previously UKAEA has only consented to irradiate small quantities of diamonds for fundamental research purposes. Charges for this new service will be fixed by arrangement. Enquiries should be addressed to the Technical Irradiation Group, Isotope Division, AERE, Harwell.

Rockefeller Research Grant

The Rockefeller Foundation announced last week that it is making a grant of £3,750 to the University of Durham, King's College, Newcastle, to provide equipment for research in the chemistry of proteins.

Process Worker's £300 Idea

£300 TAX-FREE has been awarded to Mr. W. Parkinson, a process worker at Glaxo Laboratories Ltd's. penicillin and streptomycin plant, Ulverston, Lancashire. This sum is the highest single award so far made under the company's suggestion scheme (see photograph below).

The suggestion relates to the more economic use of a material used to stop foaming during the fermentation process. When the idea was adopted it was found that the new formula simplified the process and that it would show an annual saving in materials to the extent of nearly £3,000.

Mr. Parkinson has been with the company six years. His home is at Dalton-in-Furness.

This is the second £300 award made by Glaxo Laboratories within a few months. Two process workers at Glaxo's other antibiotics plant at Barnard Castle, Co. Durham, recently earned a joint award of £300.

Shelter Inventor Dies

Founder, in 1902, of the Paterson Engineering Co. Ltd., SIR WILLIAM PATERSON (82) died on 9 August. He was born in Scotland and was apprenticed to an engineering firm. He early became interested in water purification and filed over 70 patents, many foreshadowing improvements in water purification which were not developed until years later. He devised the 'Anderson' air raid shelter and was knighted in 1944. Just over a year ago he retired from the chairmanship of his company after being in control for 53 years. He is survived by Lady Paterson and a daughter.

To Reduce Food Spoilage

THE RESULTS of research carried out since 1945 into the use of Aureomycin to reduce food spoilage are described by Dr. John Taylor in a technical bulletin just released by Cyanamid Products Ltd., Bush House, London, entitled *Chlortetracycline in the Preservation of Perishable Foods*. The bulletin outlines experiments with poultry, red meat, prepared meats, fish and whales.

In 1945 it was first discovered that various antibiotics prevented the growth of certain bacteria in food. In experiments since then, Aureomycin has proved the most effective antibiotic in this field.

In the experiments so far, it has been proved that levels as low as one to two parts per million of Acronize (a Cyanamid trade name for Aureomycin formulations) in the tissues of meat, fish and poultry are sufficient to delay considerably any bacterial growth. At these levels, about one ton of raw Acronized food would have to be consumed daily for the consumer to absorb a medicinal dose.

The bulletin states that Acronize cannot make stale food fresh but it can, if used correctly, ensure the consumer a better, fresher product. It may also facilitate factory processing.

Indian Oil and Gas Commission

An oil and natural gas commission has been appointed by the Indian Government to undertake the exploration, exploitation, and refining of mineral oil in the country. The commission has been empowered to inspect oil fields held by private concessionaires to ensure the systematic development of India's oil wealth.

Award for a good idea. Dr. F. J. Wilkins (right), a director of Glaxo Laboratories Ltd. presenting process worker W. Parkinson with a cheque for £300. This is the highest single award so far made under the company's suggestion scheme

From all Quarters

Australian Salt Deposits

In the South Australian district of Port Augusta, Solar Salt Ltd. gathered about 10,000 tons of salt in June in the first trial harvest. This company has established pumping stations diverting sea water into catchment areas totalling 17,000 acres. Solar Salt Ltd. estimate that, if properly developed, more than one million tons annually could be produced, mainly for export.

Chemical Sheep Shearing

Removal of wool from sheep by a chemical process has been reported to the Australian United Graziers' Association. The inventors claim that a chemical spray breaks wool fibre at the sheep's skin level and a few days after its application the wool can be stripped off by rubber 'fingers' fitted to a wool-removing race. It is claimed that no damage to the sheep or the wool resulted. United Graziers' Association is investigating the process.

Antibiotic Patent Granted

A patent on the new antibiotic PA-105 (oleandomycin) has been granted to Chas. Pfizer & Co. Inc., of New York. In preliminary tests oleandomycin has proved effective against staphylococci resistant to penicillin and other antibiotics. Reports indicate that oleandomycin has a synergistic activity when used in conjunction with certain other antibiotics. US Patent No. 2,757,123 covering oleandomycin, its acid salts and a process for producing the antibiotic by fermentation, lists the inventors as Ben A. Sobin, John B. Routien and Thomas M. Lees all of the Pfizer research laboratories.

BF Goodrich Plans

Plans have been announced by the BF Goodrich Co. of Canada for a new $1,225,000 headquarters building to be located at Kitchener, Ontario. It has also been announced that Mr. William B. Flora has been appointed sales vice-president of the company.

Hungary and Yugoslavia

Under a recent trade agreement between Hungary and Yugoslavia, Hungary will export, among other goods, nitrogenous fertilisers and sulphuric acid. Yugoslavian exports to Hungary will include lead, soda, and various chemicals.

French Fertiliser Quota

An announcement regarding the duty free quota of nitrogenous fertilisers into France appeared in the French *Journal Officiel,* of 27 July. The quota for the year ending 30 June 1957 has been fixed at 15,000 metric tons. This duty-free concession is limited to those imports for which a certificate of exoneration from *La Direction des Industries Chimiques* has been obtained. The French text of the notice may be seen at the Export Services Branch, Board of Trade, Room 625, Lacon House, Theobalds Road, London WC1.

French Oil Exploration

Joint oil exploration in the perigord area of central France is to be undertaken by the French company, Ste. des Petroles du Centre-Ouest and Molasse Edroelfoerderungs AG (Mofag), of Switzerland. The French company has made an application for a permit covering 200,000 hectares.

Uruguay Import Regulations

Under a decree of 4 August, chemicals may now be imported into Uruguay at the more favourable rate of 5.88 pesos per £.

Venezuela Oil

A German-backed company, Companie Petroleo de Venezuela, has been formed with an initial capital of $300,000 to prospect for oil in Venezuela. The company has already asked the Government for concessions totalling 150,000 acres in the states of Barinas and Monagas.

Sweden's Exports

Swedish exports to Yugoslavia during the next six months will include chemicals and pharmaceutical products.

LEGAL STUDIES

by Peter Pain MA

TAX AND SALE OF 'KNOW-HOW'

A DECISION of some importance has been handed down by Mr. Justice Upjohn with regard to liability for tax on sale of 'know-how' by a pharmaceutical company. His judgment was to the effect that a capital payment in return for the transmission of 'know-how' will not attract tax. (*Evans Medical Supplies Ltd. v. Moriarty* 1956;1 Weekly Law Reports, pp. 794).

Evans Medical Supplies, which carries on the business of manufacturing chemists and druggists, entered into an agreement with the Government of Burma (THE CHEMICAL AGE, 1956, (**74**), 1226), by which it contracted to assist that government in the establishment of a pharmaceutical industry. Under the terms of the agreement the company was to supply technical data and designs for the erection of a factory and the installation of machinery required for the manufacture of pharmaceutical products. It was also to disclose to the Burmese Government the secret processes used in the preparation, storage and packaging of the various pharmaceutical products, which were of great value to the company, the products themselves being of known composition.

These processes had never been disclosed before to anyone else and during the seven years' currency of the agreement the company agreed not to disclose them to anyone else in Burma. The company was to be permitted to continue its agency in Burma when the seven years were up, but the agency would obviously become of less value as the home industry was established. For this the company was to be paid £100,000.

Trading Receipt or Gains ?

First question to be considered from the tax angle was whether it could be said that the £100,000 was a trading receipt, as being part of the company's annual profits, or gains from any trade carried on by it whether in the United Kingdom or elsewhere. The judge decided that it was not a trading receipt, summing up the matter in these words:

> 'The company was not "exploiting" its business in the only sense in which that word is relevant, that is, of carrying on its trade of wholesale druggists in Burma, but in and by the agreement it entered into the entirely new activity of acting as adviser of the Burmese Government by assisting to set up a completely new industry there, which involved the disclosure to the Government of secrets never disclosed to anyone before, and also involved the gradual cessation of its wholesale trading activities.'

Second and more difficult question was whether, on the true construction of the agreement which the company made with the Burmese Government, the payment was capital or income. The Special Commissioners decided that it was income and therefore liable to tax but Mr. Justice Upjohn rejected this point of view and decided that it was capital.

The Analogy

The judge pointed out the analogy between the sale of patent rights and the sale of 'know-how'. He referred to an earlier judgment in a rather similar case dealing with engineering when Lord Justice Romer (**1**) said:

> 'The owner of a secret process, such as was possessed by Mr. Handley Page, stands in a very analogous position; he has not a monopoly at law, but he has a monopoly in fact—a monopoly in fact arising from the possession by him of the secret knowledge of the process he is carrying on.
>
> 'That secret knowledge is as much his capital asset as is the patent monopoly the capital asset of the patentee, and like the patentee, he can use that capital asset in either or both of the following ways: He can carry on the secret process or he may —it is very seldom done owing to the obvious danger involved—grant a licence to a third person to carry on the secret process, securing himself against his secret process being divulged by that third party to others.
>
> 'In both these cases the profits he derives from carrying on the secret process himself and the royalty he might derive from the licensee would be annual profits or gains within the meaning of Schedule D. But, supposing he sells his secret process, or supposing, as here, he surrenders

Tax & Sale of 'Know-How'

his quasi-monopoly by making it public to the world, then I say that, if he gets paid for doing either one or other of those things, the money he receives in payment is a capital asset.'

Mr. Justice Upjohn also referred to a case in which the principle to be applied had been laid down by Lord Greene (2): 'A lump sum payment received for the grant of a patent licence for a term of years may be a capital and not a revenue receipt, whether or not it is so must depend on any particular facts, which, in the particular case, may thrown light upon its real character, including, of course, the terms of the agreement under which the licence is granted. If the lump sum is arrived at by reference to some anticipated quantum of user it will, we think, normally be income in the hands of the recipient.

'If it is not, and if there is nothing else in the case which points to an income character, it must, in our opinion, be regarded as capital. This distinction is in some respect analogous to the familiar and perhaps equally fine distinction between payments of a purchase price by instalments and payment of a purchase price by way of annuity over a period of years.'

Present Case

The judge then went on to apply these principles to the present case. He said:

'While the agreement must be read as a whole, the question to be asked is, what, upon the proper construction of the agreement, was the *quid pro quo* for payment of the £100,000? I cannot see that it bears any relationship to the services rendered by a professional man in the course of carrying on his profession. . . .

'In consideration of this payment the company was bound to provide its expert knowledge, its "know-how" in the manufacture of pharmaceutical products, in the erection of a suitable factory and the provision of proper machinery in order to enable the Burmese Government to set up a new industry once and for all in Burma. . . . Looking at the agreement as a whole, in my judgment, payment of the sum of £100,000 is what it is described to be—a "capital payment".

'Furthermore, the company was, in fact, parting for ever with its secret information in its methods of preparation, packing and preservation to the Burmese Government; that may not in law amount to an assignment of all its rights in Burma, for the company in legal theory, though possibly not in practical Burmese politics, remained at liberty to use the processes itself in Burma. Of course it also remained at liberty to carry on its business of wholesale druggists there by selling its products made in this country, in Burma through its usual agents.

'But it was parting for ever with part of a valuable asset, and was doing so to enable an entirely new and competing industry to be set up there. That industry established by the skill and "know-how" of the company, could embark on an export trade which could compete with the company's own products in other countries. In that sense the company was dissipating its asset, and it must be remembered that a secret process once communicated to another is in jeopardy; if it gets into the wrong hand, the grantor has no protection.

'Even if it be a necessary ingredient to support a capital payment to show some dissipation of a capital asset (which, in my judgment it is not) that element seems to me to be present here.'

REFERENCES.

(1) *Handley Page v Butterworth.* 19 Tax Cases. P. 328.
(2) *Nethersole v Withers.* (1946) 28 Tax Cases. P. 501.

US Imports

THE US Tariff Commission, recently reported that general imports of coal tar chemicals totalled 6.4 million lb. in 1955 (foreign invoice value of $4.5 million). This was a decrease in quantity of imports from that in 1954, due primarily to a noticeable decline in low- and medium-priced intermediates such as adipic acid, caprolactam, *m*-chloroaniline, naphthalene, 2-naphthol and phthalic anhydride.

Imports of finished coal-tar products in 1955 totalled 5.4 million lb. valued at $11.1 million, compared with 5.1 million lb. ($8.7 million) in 1954.

The report states that dyes were the most important group of finished coal-tar products imported in 1955, as in previous years.

Courses Available in Glasgow

THE Royal Technical College, Glasgow, is offering this year a four year degree course in chemical engineering. Principal group subjects are Technical Chemistry I and II, Chemical Engineering Design, and Advanced Chemistry. Final group examinations are held at the end of the winter session, but successful graduation involves completion of an additional summer course in chemistry. This may include research work or attendance at the Practice School at Ardeer.

The College is also offering an Associateship course of four years covering this same main subject groups and also demanding successful completion of summer work. A four year course in chemistry for the Associateship is also available and a four year course has also been offered in Technical Chemistry for the Applied Chemistry Degree and Technical Chemistry Associateship courses. The chemistry staff is headed by Freeland Professor F. S. Spring and the technical chemistry staff by Patrick D. Ritchie, who is Young Professor of Technical Chemistry.

A new course offered this year for the first time is a four year associateship in Food Science which involves Food Chemistry.

The Heriot-Watt College, Edinburgh, is providing courses for the Associateship in Chemical Engineering or B.Sc. Technological of Edinburgh University with which the College co-operates.

French Oil and Rubber

CONSTRUCTION of a refinery at Strasburg with an annual capacity of between 4 and 7½ million tons is contemplated by a company formed by a number of French oil companies, one Belgian and one German company. A factory for synthetic rubber production from the refinery's waste is also being considered.

The project will include construction of a pipeline from Marseilles to feed the refinery at an estimated cost of 16½ to 18½ milliard francs, with possibilities of eventual extension to Cologne. The construction of a pipeline from Marseilles to Rotterdam is also reported to be under consideration. A refinery is to be built at Bec d'Ambes on the Garonne-Gironde confluence and is expected to go into production in 1959 with an initial annual capacity of 1.5 million tons.

Chemical Technology Course

DETAILS of the four year sandwich course in chemical technology to begin at the Borough Polytechnic in September 1956 are given in a booklet now available. The course arranged is an integrated course in which chemistry and technological subjects are studied parallel to one another throughout the four years. Students will have the choice of specialising in one of four related technologies:

(a) Plastics and high polymer technology.
(b) Paints and surface coatings technology.
(c) Oils, fats, waxes and detergents.
(d) Metal finishing.

The full programme is to be submitted to the Hives Council for Higher Technological Awards and it is hoped that students will be able to obtain the National Diploma in Technology at the end of their four years' course, which will involve alternate periods of six months in the Polytechnic and in industry. A fifth optional year will lead to the Graduateship of the RIC.

Enquiries from firms in the chemical and other industries should be addressed to the Department of Chemistry and Food Technology, Borough Polytechnic, London SE1.

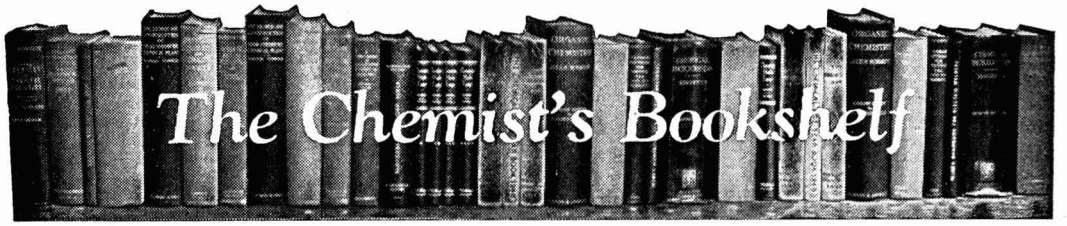
Obituary

The death has occurred of LIEUTENANT-COLONEL GARROD BENNETT, O.B.E., T.D., D.L., a director of Bleachers' Association, Ltd., Manchester, at his home at Cheadle, Cheshire. He was 58 years of age. Col. Bennett, who was an authority on bleaching and mechanical shrinkage of cloth, was connected with the Bleachers' Association for most of his working life. He became a director more than 20 years ago and joined the association's board of management in 1951. For many years he had also served on the Bleaching Trade Advisory Board.

Wills

MR. HERBERT HENRY LLOYD of Westmoreland Avenue, Hornchurch, Essex, proprietor of H. Lloyd & Co., chemical and textile exporters, left £20,532 net (duty paid £2,376).

MR. CHARLES THORNFIELD, of 10 Rutland Court, Denmark Hill, London SE, manufacturing chemist, founder and director of Furmoto Chemical Co. Ltd., who died last February, left £24,687 5s 3d gross, £24,524 16s 7d net value. (Duty paid £3,723).



PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY. Vol. 5: PHYSICS OF REACTOR DESIGN. Compiled and published by the United Nations Scientific Secretariat, New York. 1956. Pp. 545. 63$.

From the physics of neutron interactions and induced reactions recorded in sessions 6A and 7A (volume 2) and the consideration of capture and fission cross section measurements contained in volume 4, this volume continues the subject development by detailing investigations and predictions of the behaviour of neutrons within the array of atoms forming a reactor. The earlier papers in the volume report studies of neutron diffusion in beryllium, beryllium oxide, graphite and water. These are followed by details of the methods for, and results of, the assessment of different reactor potentialities. In the 'Exponential' experiments the sub-critical assembly is driven by a suitable neutron source such as an operating reactor. For 'Zero Energy' experiments the critical array of fuel elements is allowed to function at very low power. By these means, the neutron life cycle, temperature coefficient, control response and so on, may be assessed for reactor arrays in readily adaptable systems since only comparatively low radioactivity is developed. Finally, from fully operative research and power reactors, the operating characteristics may be more fully assessed and compared with the theory for the given array.

Fuel Element

Since fuel element fabrication and processing is costly, it is essential that the fuel elements shall withstand an adequate degree of irradiation for the economically successful operation of a reactor. To achieve this, the fuel element strength must remain adequate throughout its life cycle (this is considered in volume 9) and, further, the reactor must not lose its reactivity. Three papers (P/5, P/835 and P/432) consider this decrease in reactivity which, for the conventional uranium thermal reactor, is due to the production of neutron absorbing fission products (in particular, the highly neutron absorbent Sm^{149}) and the degree of burn up of the fissionable U^{235} which is, in part, offset by production of fissionable Pu^{239}. (Fission product yields are more fully reported in session 8 B1 volume 7.) The implication of this on operating cycles both with U^{238} or Th^{232} as the fertile material is discussed in an American contribution (P/835).

Canadian Reactor

Incidentally, papers P/5 and P/6 give an interesting account of the operating characteristics of the highly successful Canadian high neutron flux, heavy water moderated, NRX reactor with which high fuel irradiations have been achieved. The desirability of more information of this type was expressed when reviewing the sessions on research reactors recorded in volume 2.

The instrumentation systems have been discussed in connection with specific reactors (volumes 2 and 3) but the series apparently contains little detailed information on this subject. Within this volume is one paper (P/434) devoted to neutron flux instrumentation systems applicable to routine and emergency control.

Session 23A was devoted to papers on reactor theory while the whole volume is interspersed with pertinent theoretical papers. Paper P/334 describes briefly the application of analogue computers to the solution of reactor kinetics problems.—J.S.M.B.

Italian Exports

Under the extended Italo-Dutch Trade Agreement, new quota lists of goods to be exchanged between the two countries have been drawn up. Italian exports to the Netherlands will include chemical products.

Publications & Announcements

INFORMATION on Telcothene polythene tubing for industrial, domestic and agricultural purposes is contained in a brochure published by The Telegraph Construction & Maintenance Co. Ltd., Mercury House, Theobalds Road, London WC1. Apart from its well-known physical and chemical properties, strong claims are made for the ease of handling of Telcothene. The tubing is tough and flexible. It will coil and bend, and is suitable for laying over undulating land and for using with a mole plough for laying underground. It is claimed that tubing laid underground can withstand substantial soil subsidence. Enough information appears to be contained in this brochure to enable a potential user to decide whether Telcothene is a suitable material for his own particular requirements.

* * *

AN ILLUSTRATED pamphlet entitled *Application of Industrial Lubricating Oils* by A. M. Craig, gives details of the various methods of applying lubricating oils classified into two main groups, *viz:*—(1) Non-centralised, (2) centralised systems—(a) Manual, (b) Fully automatic, (i) non-circulating, (ii) circulating. The pamphlet is obtainable from Liquid Systems Ltd., 7 Union Road, Croydon.

* * *

IN HER battle to retain a leading position in the world's trading markets, Great Britain must strive for greater efficiency. And one of the ways to achieve such an aim is by improved supervision in the factory. This conclusion was reached after a discussion between five people from different spheres of industrial life and which has been recorded in a booklet entitled *Training for Supervisors.* The fourth in the 'True Story' series issued by the Ministry of Labour and National Service, the booklet was published recently. The five people met under the chairmanship of an officer of the Ministry to express views on the conclusions of the 1954 Report of the Committee of Inquiry on the Training of Supervisors and relate these to their own experience in industry. The publication, which is being distributed through voluntary organisations, has been prepared in collaboration with the Central Office of Information and with the aid of a grant made available under the Conditional Aid Scheme for the Use of Counterpart Funds derived from United States Economic Aid. It is not for sale, but copies can be obtained on request from the Director of Public Relations, Ministry of Labour and National Service, 8 St. James's Square, London, SW1, or from any local office of the Ministry.

* * *

JUST PUBLISHED is the 4th edition of *The BCAS Technical Reference Book of Compressed Air Terms and Standards.* This reference work for engineers has been revised and contains a completely new part on pneumatic control equipment. Additions have been made to the series of tables and graphs, which are of great value to those concerned with air and gas compressors, pneumatic tools (for general, and engineering and mining applications) or pneumatic control equipment. The binding has also been considerably improved by the use of an attractive stiffener. The book is obtainable from the British Compressed Air Society, 32 Victoria Street, London SW1, price 20s post free.

* * *

SUPPORT from industry for the work of the Britsh Standards Institution is reflected in *BSI Annual Report* for 1955-56. Nearly 4,000 technical committee meetings are recorded, which resulted in the publication of more than 200 new standards. Sales of British Standards reached a new record level of 934,000, a quarter of these being sold abroad. An account is given of BSI's increasing contribution to the work of the International Organisation for Stanardisation (ISO) and of the International Electrotechnical Commission (IEC). An undertaking of particular interest here was the work on tests for chemicals, and proposals for common names for pest control chemicals.

Mined for First Time

Cadmium, a metal never before mined in Africa, will be produced this year by the Broken Hill mine in Northern Rhodesia.

Chemical & Allied Stocks & Shares

SHARES of chemical and allied companies have naturally moved very closely with the general trend in stock markets, which suffered a sharp fall following the initial impact of the Egyptian news but have since shown only a moderate rally. Many well-known companies have followed the Government's request to freeze prices and help to check inflation. Moreover, it is clear that in many directions costs are still rising, and that profit margins are falling.

In the circumstances, it seems that unless a company succeeds in expanding turnover, earnings are unlikely to exceed last year's level. Consequently, demand for chemical shares has been much more selective in recent weeks. Nevertheless, although in general they offer little scope for higher dividends, in very many cases dividends last year were covered by a large margin of profit. In fact there would have to be a heavy fall in earnings to necessitate any cut in future dividend payments.

It is this and the progressive policy being followed by most chemical companies which give their shares attractions as long-term investments, for the chemical industry is still growing and expanding—a fact which is sometimes overlooked in the City.

It is clear that the authorities are worried by the impact of inflation, which has been increased in some directions by the international developments arising from the Egyptian trouble. Moreover, it is feared that whatever solution there is to the problem, charges to shipping for using the Suez canal are bound to be increased. This would of course tend to raise prices of commodities and goods shipped through the canal.

Half-Yearly Profit Figures

In view of the difficulty of assessing the trend in profits, there are growing hopes in the City that more companies will adopt the practice of issuing half-yearly profit figures or progress reports. Some leading chemical companies already do this and more are expected to do so. There is no doubt that additional information of this kind is welcomed by shareholders, and what is sometimes overlooked is that it can also have important publicity value.

Reflecting the general trend in stock markets, Imperial Chemical shares have declined to 44s 6d, which compares with 45s 7½d a month ago. Rightly or wrongly it is being widely assumed that the group's decision to freeze prices of over 10,000 of its products means the dividend for the current year will not be increased but merely maintained at 10 per cent. Nevertheless, there can be no doubt that pegging prices should mean increased turnover, and the policy is no doubt in the long-term interests of shareholders.

Laporte 5s shares at 18s were 3d above the level ruling a month ago, and Monsanto 5s shares 25s 6d compared with 25s.

Share Movements

Elsewhere, Greeff-Chemicals Holdings 5s shares were 15s 9d, William Blythe 3s shares have again changed hands quite actively at close on 12s. Morgan Crucible 'A' ordinary shares were 42s, and General Refractories 10s shares have firmed up to 31s 4½d.

Triplex Glass fell back from 37s to 34s 9d on the unexpected decision to reduce the dividend on these 10s shares from 25 per cent to 20 per cent despite the group's record profits. This decision was taken, Sir Graham Cunningham and his co-directors said, to help the fight against inflation. Many companies have not raised dividends because of the Government's request for moderation. But this is the first big company to cut its dividend for this reason. Another reason for the decision is that the group is engaged in financing expansion plans.

There was again a good deal of activity in Hickson & Welch 10s shares which rose to 31s, but later eased to 29s 6d. Anchor Chemical 5s shares eased from 12s 6d to 12s. British Glues 4s units moved down from 10s 9d to 9s 6d.

Reichhold Chemical 5s shares at 15s 9d were within 3d of the level ruling a month ago, while Albright & Wilson 5s shares have come back on the month from 20s 6d to 20s 1½d, and elsewhere, Hardman & Holden 5s shares eased from 11s 3d to 11s.

Fisons at 51s 9d were virtually the same as a month ago. Brotherton 10s shares have been maintained at 29s 4½d.

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British Chemical Prices

(These prices are checked with the manufacturers, but it must be pointed out that in many cases there are variations according to quantity, quality, place of delivery, etc.)

LONDON Most sections of the market are returning to more active conditions and the volume of inquiry in circulation during the past week was greater than during the first half of August. Export trade remains good, the buyers seeking keen quotations. The price position is firm though actual price movements have been few and mainly concern the chemical compounds of the non-ferrous metals. The demand for the coal-tar products continues steady with pitch in good request on home account and a fair export call for road tar and creosote oil.

MANCHESTER Industrial holidays in Lancashire and Cheshire continue to affect the movement of supplies of heavy Chemicals on the Manchester market, though the end of this seasonal factor is now approaching. There has been a fair aggregate demand for contract deliveries of the alkalis and other principal products. Inquiries from home users as well as shippers are coming through reasonably well. Prices generally remain on a firm basis, an exception during the past week being a drop of £4 a ton in sulphate of copper. A moderate aggregate business is being done in fertilisers, with a fairly steady demand reported for most of the tar products.

GLASGOW Continued quietness is still general in the Scottish heavy chemical market, although towards the latter part of the week a little improvement was observed in contract and spot requirements. Prices generally have remained steady, with a slight firming in certain directions. Demand for agricultural chemicals has been maintained, and export business continues at a favourable level with the usual volume of inquiries being received.

General Chemicals

Acetic Acid.—Per ton : 80% technical, 10 tons, £91 ; 80% pure, 10 tons, £97 ; commercial glacial, 10 tons, £99 ; delivered buyers' premises in returnable barrels (technical acid barrels free) ; in glass carboys, £8 ; demijohns, £12 extra.

Acetic Anhydride.—Ton lots d/d, £132 per ton.

Alum.—Ground, about £25 per ton, f.o.r. MANCHESTER : Ground, £25.

Aluminium Sulphate.—Ex works, £15 10s per ton d/d. MANCHESTER : £15 15s to £18 10s.

Ammonia, Anhydrous.—1s 9d to 2s 3d per lb.

Ammonium Bicarbonate.—2-cwt. non-returnable drums, 1-cwt. non-returnable kegs ; 1-ton lots, £50 5s per ton.

Ammonium Chloride.—Per ton lot, in non-returnable packaging, £29 2s 6d.

Ammonium Nitrate.—D/d, £31 per ton (in 4-ton lots).

Ammonium Persulphate. — MANCHESTER : £6 2s 6d per cwt., in 1-cwt. lots, delivered. £112 10s per ton, in minimum 1-ton lots, delivered.

Ammonium Phosphate.—Mono- and di-, ton lots, d/d, £106 and £97 10s per ton.

Antimony Sulphide.—Crimson, 4s 5d to 4s 10½d ; golden, 2s 8½d to 4s 1¾d ; all per lb., delivered UK in minimum 1-ton lots.

Arsenic.—Per ton, £45 to £50 ex store.

Barium Carbonate.—Precip., d/d ; 4-ton lots, £40 10s per ton, bag packing.

Barium Chloride.—£49 per ton in 2-ton lots.

Barium Sulphate (Dry Blanc Fixe).—Precip., 2-ton lots, £35 per ton d/d.

Bleaching Powder.—£28 12 6d per ton in returnable casks, carriage paid station, in 4-ton lots.

Borax.—Per ton for ton lots, in hessian sacks, carriage paid : Technical, anhydrous, £61 10s ; granular, £41 ; crystal, £43 10s ; powder, £44 10s ; extra fine powder, £45 10s ; BP, granular, £50 ; crystal, £52 10s ; powder, £53 10s ; extra fine powder, £54 10s.

Boric Acid.—Per ton for ton lots, in hessian sacks, carriage paid : Technical, granular, £70 ; crystal, £78 ; powder, £75 10s ; extra fine powder, £77 10s ; BP granular, £83 ; crystal, £90 ; powder, £87 10s ; extra fine powder, £89 10s.

Calcium Chloride.—Per ton lots, in non-returnable packaging : solid and flake, £16.

Chlorine, Liquid.— £38 5s per ton, in returnable 16-17-cwt. drums, delivered address in 3-drum lots.

Chromic Acid.—2s 0⅝d per lb., less 2½%, d/d UK, in 1-ton lots.

Chromium Sulphate, Basic.—Crystals, 8⅛d per lb. delivered (£75 16s 8d per ton).

Citric Acid.—1-cwt. lots, £10 5s cwt.

Cobalt Oxide.—Black, delivered, bulk quantities, 13s 2d per lb.

Copper Carbonate.—3s 3d per lb.

Copper Sulphate.—£98 12s 6d per ton f.o.b., less 2% in 2-cwt. bags.

Cream of Tartar.—100%, per cwt., about £11 12s.

Formaldehyde.—£37 5s per ton in casks, d/d.

Formic Acid.—85%, £86 10s in 4-ton lots, carriage paid.

Glycerine.—Chemically pure, double distilled 1.260 SG, £12 9s 0d per cwt. Refined pale straw industrial, 5s per cwt. less than chemically pure.

Hydrochloric Acid.—Spot, about 12s per carboy d/d, according to purity, strength and locality.

Hydrofluoric Acid.—59/60%, about 1s 6d per lb.

Hydrogen Peroxide.—27.5% wt., £128 10s per ton. 35% wt., £158 per ton d/d. Carboys extra and returnable.

Iodine.—Resublimed BP, 17s 7d per lb., in 28-lb. lots.

Iodoform.—£1 6s 7d per lb., in 28-lb. lots.

Lactic Acid.—Pale tech., 44 per cent by weight, 14d per lb. ; dark tech., 44 per cent by weight, 9d per lb., ex-works ; chemical quality, 44 per cent by weight, 12¼d per lb., ex-works ; 1-ton lots, usual container terms.

Lead Acetate.—White : About £150 per ton.

Lead Nitrate.—About £135 1-ton lots.

Lead, Red.—Basis prices per ton. Genuine dry red, £142 15s ; orange lead, £154 15s. Ground in oil : red, £160 15s ; orange, £172 15s.

Lead, White.—Basis prices : Dry English in 5-cwt. casks £147 15s per ton. Ground in oil : English, 1-cwt. lots 194s per cwt.

Lime Acetate.—Brown, ton lots, d/d, £40 per ton ; grey, 80-82%, ton lots, d/d, £45 per ton.

Litharge.—£144 15s per ton, in 5-ton lots.

Magnesite.—Calcined, in bags, ex-works, about £21 per ton.

Magnesium Carbonate.—Light, commercial, d/d, 2-ton lots, £84 10s per ton, under 2 tons, £92 per ton.

Magnesium Chloride.—Solid (ex-wharf), £16 10s per ton.

Magnesium Oxide.—Light, commercial, d/d, under 1-ton lots, £245 per ton.

Magnesium Sulphate.—Crystals, £16 per ton.

Mercuric Chloride.—Technical powder, £1 3s 6d per lb., in 5-cwt. lots ; smaller quantities dearer.

Mercury Sulphide, Red.—£1 9s 3d per lb., for 5-cwt. lots.

Nickel Sulphate.—D/d, buyers UK £170 per ton. Nominal.

Nitric Acid.—80° Tw., £35 per ton.

Oxalic Acid.—Home manufacture, minimum 4-ton lots, in 5-cwt. casks, about £131 per ton, carriage paid.

Phosphoric Acid.—Technical (SG 1.700) ton lots, carriage paid, £100 per ton ; BP (SG 1.750), ton lots, carriage paid, 1s 3½d per lb.

Potash, Caustic.—Solid, £93 10s per ton for 1-ton lots ; liquid, £34 15s.

Potassium Carbonate. — Calcined, 96/98%, about £74 10s per ton for 1-ton lots, ex-store.

Potassium Chloride.—Industrial, 96%, 1-ton lots, about £24 per ton.

Potassium Dichromate.—Crystals and granular, 1s 1½d per lb., in 5-cwt. to 1-ton lots, d/d UK.

Potassium Iodide.—BP, 14s 1d per lb. in 28-lb. lots ; 13s 7d in cwt. lots.

Potassium Nitrate.—In 4-ton lots, in non-returnable packaging, paid address, £63 10s per ton.

Potassium Permanganate.—BP, 1-cwt. lots, 1s 9d per lb. ; 3-cwt. lots, 1s 8½d per lb. ; 5-cwt. lots, 1s 8d per lb. ; 1-ton lots, 1s 7¾d per lb. ; 5-ton lots, 1s 7¼d per lb. ; Tech., 5-cwt. packed in 1-cwt. drums, £8 14s 6d per cwt. ; packed in 1 drum, £8 9s. 6d per cwt.

Salammoniac.—Per ton lot, in non-returnable packaging, £45 10s.

Salicylic Acid. — MANCHESTER : Technical 2s 8½d per lb. d/d.

Soda Ash.—58% ex-depot or d/d, London station, about £16 8s per ton, 1-ton lots.

Soda, Caustic.—Solid 76/77% ; spot, £32 6s 6d per ton d/d (4 ton lots).

Sodium Acetate.—Commercial crystals, £91 per ton d/d.

Sodium Bicarbonate.—Per ton lot, in non-returnable packaging, £17.

Sodium Bisulphite. — Powder, 60/62%, £42 15s d/d in 2-ton lots for home trade.

Sodium Carbonate Monohydrate.—Per ton lot, in non-returnable packaging, paid address, £57.

Sodium Chlorate.—About £80 per ton in 1-cwt. drums, carriage paid station, in 4-ton lots.

Sodium Cyanide.—96/98%, £113 5s per ton lot in 1-cwt. drums.

Sodium Dichromate.—Crystals, cake and powder, 11¼d per lb. Net d/d UK, anhydrous, 1s 1d per lb. Net del. d/d UK, 5-cwt. to 1-ton lots.

Sodium Fluoride.—Delivered, 1-ton lots and over, £5 per cwt. ; 1-cwt. lots, £5 10s per cwt.

Sodium Hyposulphite.—Pea crystals £35 15s a ton ; commercial, 1-ton lots, £32 10s per ton, carriage paid.

Sodium Iodide.—BP, 17s 1d per lb. in 28-lb. lots.

Sodium Metaphosphate (Calgon).—Flaked, paper sacks, £133 per ton.

Sodium Metasilicate.—£25 per ton, d/d UK in ton lots, loaned bags.

Sodium Nitrate.—Chilean refined granulated over 98% 6-ton lots, d/d station, £28 10s per ton.

Sodium Nitrite.—£32 per ton (4-ton lots).

Sodium Percarbonate.—12½% available oxygen, £8 6s 9d per cwt. in 1-cwt. kegs.

Sodium Phosphate.—Per ton d/d for ton lots : di-sodium, crystalline, £40 10s, anhydrous, £88 ; tri-sodium, crystalline, £39 10s, anhydrous, £86.

Sodium Silicate.—75-84° Tw. Lancashire and Cheshire, 4-ton lots, d/d station in loaned drums, £10 15s per ton ; Dorset, Somerset and Devon, £3 17s 6d per ton extra ; Scotland and S. Wales, £3 per ton extra. Elsewhere in England, excluding Cornwall, and Wales, £1 12s 6d per ton extra.

Sodium Sulphate (Desiccated Glauber's Salts).—d/d in bags ton, £18.

Sodium Sulphate (Glauber's Salt).—£9 5s to £10 5s per ton d/d.

Sodium Sulphate (Salt Cake).—Unground, £6 per ton d/d station in bulk. MANCHESTER : £7 per ton d/d station.

Sodium Sulphide.—Solid, 60/62%, spot, £33 2s 6d per ton, d/d, in drums in 1-ton lots ; broken, £34 2s 6d per ton, d/d, in drums in 1-ton lots.

Sodium Sulphite.—Anhydrous, £66 5s per ton ; commercial, £25 5s to £27 per ton d/d station in bags.

Sulphur.—Per ton for 4 tons or more, ground, £20 to £22, according to fineness.

Sulphuric Acid.—Net, naked at works, 168° Tw. according to quality, per ton, £10 7s 6d to £12 ; 140° Tw., arsenic free, per ton, £8 12s 6d ; 140° Tw., arsenious, per ton, £8 4s 6d.

Tartaric Acid.—Per cwt. : 10 cwt. or more £13 10s, one cwt. £13 15s.

Titanium Oxide.—Standard grade comm., with rutile structure, £172 per ton ; standard grade comm., £152 per ton.

Zinc Oxide.—Maximum price per ton for 2-ton lots, d/d, white seal, £115 ; green seal, £113 ; red seal, 2-ton lots, £110 per ton.

Solvents & Plasticisers

Acetone.—Small lots : In 5-gal. cans : 5-gal., £125, 10-gal. and upward, £115, cans included. In 40/45 gal. returnable drums, spot : Less than 1 ton, £90 ; 1 to less than 5 tons, £87 ; 5 to less than 10 tons, £86 ; 10 tons and upward, £85. In tank wagons, spot : 1 to less than 5 tons (min. 400 gal.), £85 ; 5 to less than 10 tons (1,500 gal.), £84 ; 10 tons and upward (2,500 gal.), £83 ; contract rebate, £2. All per ton d/d.

Butyl Acetate BSS.—£165 per ton, in 10-ton lots.

***n*-Butyl alcohol, BSS.**—10 tons, in drums, £152 per ton d/d.

***sec*-Butyl Alcohol.**—5 gal. drums £159 ; 40 gal. drums : less than 1 ton £124 per ton ; 1 to 10 tons £123 per ton ; 10 tons and over £119 per ton ; 100 tons and over £120 per ton.

***tert*-Butyl Alcohol.**—5-gal. drums £195 10s per ton ; 40/45 gal. drums : less than 1 ton £175 10s per ton ; 1 to 5 tons £174 10s per ton ; 5 to 10 tons, £173 10s ; 10 tons and over £172 10s.

Diacetone Alcohol.—Small lots : 5 gal. drums, £177 per ton ; 10 gal. drums, £167 per ton. In 40/45 gal. drums ; less than 1 ton, £142 per ton ; 1 to 9 tons, £141 per ton ; 10 to 50 tons, £140 per ton ; 50 to 100 tons, £139 per ton ; 100 tons and over, £138 per ton.

Dibutyl Phthalate.—In drums, 10 tons, 2s per lb. d/d ; 45-gal. drums, 2s 1½d per lb. d/d.

Diethyl Phthalate.—In drums, 10 tons, 1s 11½d per lb. d/d ; 45 gal. drums, 2s 1d per lb. d/d.

Dimethyl Phthalate.—In drums, 10 tons, 1s 9¼d per lb. d/d ; 45 gal. drums, 1s 10½d per lb. d/d.

Dioctyl Phthalate.—In drums, 10 tons, 2s 8d per lb. d/d ; 45 gal. drums, 2s 9½d per lb. d/d.

Ether BSS.—In 1 ton lots, 1s 11d per lb. ; drums extra.

Ethyl Acetate.—10 tons lots, d/d, £135 per ton.

Ethyl Alcohol (PBS 66 o.p.).—Over 300,000 p. gal., 2s 11¼d ; 2,500-10,000 p. gal., 3s 1¾d per p. gal., d/d in tankers. D/D in 40/45-gal. drums, 1d p.p.g. extra. Absolute alcohol (75.2 o.p.) 5d p.p.g. extra.

Methanol.—Pure synthetic, d/d, £43 15s per ton.

Methylated Spirit.—Industrial 66° o.p. : 500 gal. and over in tankers, 5s 4d per gal. d/d ; 100-499 gal. in drums, 5s 8½d per gal. d/d. Pyridinised 64 o.p. : 500 gal. and over in tankers, 5s 6d per gal. d/d ; 100-499 gal. in drums, 5s 10½d per gal. d/d.

Methyl Ethyl Ketone.—10-ton lots, £133 per ton d/d ; 100-ton lots, £131 per ton d/d.

Methyl *iso*Butyl Ketone.—10 tons and over, £159 per ton.

***iso*Propyl Acetate.**—In drums, 10 tons, £130 per ton d/d ; 45 gal. drums, £136 per ton d/d.

***iso*Propyl Alcohol.**—Small lots: 5-gal. drums, £118 per ton ; 10-gal. drums, £108 per ton ; in 40-45 gal. drums ; less than 1 ton, £83 per ton ; 1 to 9 tons, £81 per ton ; 10 to 50 tons, £80 10s per ton ; 50 tons and over, £80 per ton.

Rubber Chemicals

Carbon Disulphide.—£61 to £67 per ton, according to quality.

Carbon Black.—8d to 1s per lb., according to packing.

Carbon Tetrachloride.—Ton lots, £79 10s per ton.

India-Rubber Substitutes.—White, 1s 7¾d to 1s 11½d per lb. ; dark, 1s 4d to 1s 6¾d per lb. delivered free to customers' works.

Lithopone.—30%, about £55 per ton.

Mineral Black.—£7 10s to £10 per ton.

Sulphur Chloride.—British, about £50 per ton.

Vegetable Lamp Black.—£64 8s per ton in 2-ton lots.

Vermilion.—Pale or deep, 15s 6d per lb. for 7-lb. lots.

Coal-Tar Products

Benzole.—Per gal., minimum of 200 gals. delivered in bulk, 90's, 5s ; pure, 5s 4d.

Carbolic Acid.—Crystals, minimum price 1s 4d per lb. delivered in bulk, ¼d per lb. extra in 40/50 gal. returnable drums. Crude, 60's, 8s per gal. Manchester : Crystals, 1s 4d to 1s 7d per lb., d/d crude, 8s naked, at works.

Creosote.— Home trade, 1s to 1s 9d per gal. according to quality, f.o.r. maker's works. MANCHESTER : 1s to 1s 8d per gal.

Cresylic Acid.—Pale 99/100%, 6s 4d per gal. ; 99.5/100%, 6s 6d per gal. D/d UK in bulk : Pale ADF from 7s 3d per imperial gallon f.o.b. UK, 95 cents per US gallon, c.i.f. NY.

Naphtha.—Solvent, 90/160°, 5s per gal ; heavy, 90/190°, 3s 11d per gal. for bulk 1000-gal. lots, d/d. Drums extra ; higher prices for smaller lots.

Naphthalene.—Crude, 4-ton lots, in buyers' bags, £18 6s 0d to £29 19s 6d per ton nominal, according to m.p. ; hot pressed, £41 19s 0d per ton in bulk ex-works ; refined crystals, £61 10s 0d per ton d/d min. 4-ton lots.

Pitch.—Medium, soft, home trade, £9 per ton f.o.r. suppliers' works ; export trade about £10 10s per ton f.o.b. suppliers' port.

Pyridine.—90/160, 20/- to £1 2s 6d per gal.

Toluole.—Pure, 5s 9d ; 90's 5s 0d per gal. d/d. 1000 gal. lots in bulk. MANCHESTER : Pure, 5s 9d per gal. naked.

Xylole.—5s 11½d to 6s 3½d per gal., according to grade, in 1,000 gal. lots d/d London area in bulk.

Intermediates & Dyes
(Prices Nominal)

***m*-Cresol 98/100%.**—4s 9d per lb. d/d.

***o*-Cresol 30/31° C.**—1s per lb. d/d.

***p*-Cresol 34/35° C.**—4s 9d per lb. d/d.

Dichloraniline.—4s 6d per lb.

Dinitrobenzene.—88/99° C., 2s 1d per lb.

Dinitrotoluene.— SP 15° C., 2s 1½d per lb. ; SP 26° C., 1s 5d per lb. ; SP 33° C., 1s 2½d per lb. ; SP 66/68; C., 1s 11d per lb. Drums extra.

***p*-Nitraniline.**—5s 1d per lb.

Nitrobenzene.—Spot, 10d per lb. in 90-gal. drums, drums extra, 1-ton lots d/d buyers' works.

Nitronaphthalene.—2s 5½d per lb.

***o*-Toluidine.**—1s 11d per lb., in 8/10-cwt. drums, drums extra.

***p*-Toluidine.**—6s 1d per lb., in casks.

Dimethylaniline.—3s 5d per lb., drums extra, carriage paid.

COMPANY MEETING

The Distillers Company Limited

THE following is an extract from the statement by the chairman, Sir Henry J. Ross, issued with the report and accounts for the year ended 31 March 1956:—

As you will note from the accounts, the trading profit, after depreciaton, for the year to 31 March 1956, is £19,584,795, which is an improvement on last year of £1,503,208, and confirms the indication given when the interim dividend was declared. The year's trading throughout the group has been active, and these satisfactory results reflect the contributions of all our various divisions, although the increased profit this year has been derived principally from our Scotch whisky and gin interests, to which I will refer in greater detail later. At this point, however, I would say that your board, having given careful consideration to the question of publication of separate figures for the profits earned in the various sections of the company's business, adheres to its view that the provision of such information would not serve any useful purpose. As a general comment, I may say that the greater proportion of our total earnings is attributable to the whisky and gin companies but on the other hand, our industrial and general operations are satisfactory and profitable.

Industrial Developments

Many of our new industrial developments and extensons have only been installed during recent years, and I am satisfied that, conforming as they do to a logical pattern of industrial development in the UK and overseas, they should contribute steadily improved results in the future.

After deducting interest on loans, the profit from all sources is £20,311,430, out of which we have to provide £10,484,301 for taxation. Deducting the proportion of the balance attributable to minority interests in subsidiary companies, £617,260, the net profit of the company is £9,209,869, compared with £7,873,409 for the previous year.

You will observe that there is a substantial credit of £1,706,382 ' below the line ' for taxation adjustments in respect of earlier years. I am glad to report that the group's position in relation to the excess profits tax imposed during the war has now been agreed, and this credit is mainly due to settlement of our claim for deferred repairs and renewals. I should perhaps mention that it has also been agreed with the Inland Revenue that the group is not liable to the excess profits levy which operated during some of the post-war years.

Your directors have decided to write down certain investments in subsidiaries and trade investments. After applying £1,121,017 in this way, and dealing with one or two minor matters, the amount available for appropriation is £9,948,442, compared with £8,467,350 last year.

Scotch Whisky

Turning to the consolidated balance sheet, you will observe that during the year we expended approximately £4,000,000 on new buildings and plant. On the Scotch whisky side of our business, this reflects the provision of additional distilling capacity and warehouse accommodation, as well as part of the cost of building new premises for one of our major blending subsidiaries. We have also been engaged on the erection of new premises for one of our principal gin companies. On the industrial side, the main capital expenditure has been incurred by our plastics division, where, as reported last year, a large extension has been made to the plant for the manufacture of Geon polyvinyl chloride and a plant has been erected for the manufacture of Styron polystyrene.

As mentioned above, the amount available for appropriation is £9,948,442, of which the subsidiaries have retained £2,803,171, leaving £7,145,271 at the disposal of your board. In considering how this sum should be dealt with, we have had due regard to the serious difficulties which beset industry in general today. In the inflationary conditions which have marked the post-war years, it has been essential to retain a portion of profits purely to maintain our real working capital despite the depreciating currency. At the present time, having regard to the financial restrictions imposed on industry, we must also endeavour to augment our resources by such sums as we consider necessary for the essential development of the business. The

Company Meeting

burden of taxation which has to be borne makes it extremely difficult for companies such as ours to deal with these problems.

Notwithstanding all these factors, your directors feel that, in view of these improved results, a moderate increase should be made in the dividend paid to our ordinary shareholders, of whom we now have about 100,000. They therefore recommended that the final dividend on the ordinary capital should be at the rate of nine and one-fifth pence per share, which, with the interim already paid, makes one shilling and twopence per share for the year, equivalent to 17½ per cent, compared with 16 per cent last year. Of the remainder, the board has transferred £2,697,500 to augment the general reserve of the company, leaving £158,169 to be added to the amount brought forward from the previous account.

Malt Distilleries

Although our malt distilleries were scheduled to operate at full capacity, production was unfortunately somewhat curtailed by shortage of water, due to the abnormally low rainfall. The opening of the malt whisky distilling season was accordingly delayed and, for the same reason, production had again to be reduced at certain distilleries in May and June of the current year. On the other hand, our grain distilleries were able to operate normally, so that over all it may be said that production was reasonably satisfactory.

In the year under review, our production side was strengthened by the re-opening of Imperial Distillery on Speyside. This distillery, which had not operated since 1925, came into production again in December last. Completely re-designed under the supervision of our own architects and engineers, it includes the latest equipment without departing in any way from the traditional processes for the production of malt whisky. Although the whisky now produced at this distillery will not be ready for use in our blends for some years, I am confident its quality will prove to be of a high standard.

I referred in my last statement to the much higher cost of the whisky produced since the war, which we are now using. This factor, together with other increases in costs, made it imperative during the past year to raise both our home and export prices. It will, however, be of interest to shareholders and consumers alike, to know that our current selling price at home, apart from duty, is still little more than double the pre-war figure. During the same period, the duty on Scotch whisky has almost trebled, and today stands at the staggering figure of £10 10s 10d per proof gallon. Our feeling is that the retail price is in danger of reaching a level which might well place Scotch whisky beyond the means of the consumer. Pressure from the distributive side of the trade for a higher margin has been resisted on this ground, but we are bound to say that their case is not without merit, and the Government's share of the total proceeds is unreasonably large.

As regards gin, there are no aspects which call for special comment at this time, other than to report that our companies are making excellent progress, and enjoying increased home and export sales. This section of our organisation plays a valuable part in our over-all economy.

The plant of The Distillers Co. Ltd., Delaware, at Linden, New Jersey, US, continues to operate at full capacity, and sales for the year were substantially in excess of the record established in 1954.

In South Africa, our gin establishment at Isando, Transvaal, is also developing in an encouraging manner, with sales showing a substantial increase over the preceding twelve months.

Raw Materials Costs

The industrial group has made satisfactory progress during the past year in face of strong competition as regards certain products and despite the higher cost of raw materials and labour. We have endeavoured, through improved processes and efficiencies, to absorb the major part of these increases and keep our prices stable. While inevitably there has been some contraction in margins, the over-all profit earned corresponds closely to that of last year.

Chemical division. Sales of solvents and other synthetic chemicals and intermediates made at our British Industrial Solvents factories at Hull, Bromborough and Carshalton are satisfactory. We are continually extending the range of our specialities in the

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Threat to US Mining Industry

Rapidly Dwindling Deposits

AMERICAN mining industry is faced with an incontrovertible fact: accessible deposits of high grade materials are dwindling rapidly. So states the July news bulletin, *Research for Industry*, published by the Stanford Research Institute of Menlo Park, California, US.

The growing shortage of such materials, the bulletin continues, is of special consequence to the eleven Western states, historically the leading US producers of such essential minerals as copper, mercury, boron, tungsten, potash, phosphate, silver and gold. Research budgets of mining companies, therefore, are being augmented to develop profitable means of upgrading abundant lower-quality deposits and residues of earlier mining operations. SRI's process engineers (chemical, metallurgical, and ceramic), with the assistance of inorganic and surface chemists and economists, have been taking an active lead in beneficiation of metallic and non-metallic ores. Selection or development of a beneficiation process is based on a thorough mineralogical, chemical and physical property evaluation by Institute scientists. Staff economists study marketability and distribution of mineral products, and costs of raw materials.

Co-ordinated Effort

A significant example of the SRI co-ordinated effort is the recent successful project conducted on the beneficiation of a phosphate sand deposit on the west coast of Baja, California. A potentially limitless source of phosphate for Western US and Orient fertiliser makers was discovered in 30-odd miles of lagoons and offshore bars of sand. The phosphate was found—and replenished by natural phenomena—in the lagoons and islands as a very low-grade (4 per cent P_2O_5) ore. Despite its low quality, the ore became of interest for several reasons: the apparently boundless quantity and accessible location; presence of valuable by-products (quartz, zircon, ilmenite); and its existence as a surface deposit of unconsolidated, uniformly sized sand already washed free of slime impurities. The latter conditions enabled the bypassing of the normal preprocessing steps to an upgrading procedure.

Having turned up this basic data, the discoverers of the deposit asked SRI to study a number of continuous beneficiation processes to determine those most suitable for economical treatment. Combinations of upgrading techniques were studied and their cost and efficiency determined. The study disclosed that one of the most applicable processes was flotation. The surface of the phosphate particles and particle-size distribution made it ideal for anionic flotation. In the first step of this recovery process, a fatty acid film is absorbed and reacts with the red phosphate particles making them water-repellent but adherent to air. The coated phosphate particles are propelled upward with air bubbles in a vessel to form a froth at the surface which can be skimmed off.

Separation of Materials

The product contains 20 per cent P_2O_5. The phosphate, however, must be upgraded to the 25-30 per cent range required for commercial uses. By subsequent separation of accessory materials (ferro-magnesians, ilmenite, zircon) by cationic flotation or electrostatically, the phosphate is boosted into the desired range. Through magnetic separations, impurities containing iron can be extracted for a richer phosphate. By additional treatment, the valuable by-products can be obtained in saleable form. At this stage of the project, a 'floating pilot plant' is under consideration as well as a complete market study.

The bulletin also reveals that SRI's biology department is screening various chemical compounds in a large-scale search for drugs useful in treating cancer. Four other research laboratories are also testing compounds in a continuing programme which started early in 1956 under contracts awarded by the Public Health Service. Each compound is tested by SRI personnel against three tumours implanted into strains of mice which have been bred for susceptibility. Compounds currently used in cancer therapy are proving successful to a degree in prolonging the lives of those afflicted by some forms of cancer. However, the compounds have no curative properties.

[*turn to next page*

Analytical Chemistry Congress

THROUGH its Scottish section the Society for Analytical Chemistry is organising a congress to be held from 24 to 28 June 1957 at St. Andrews Universty at which new developments in chemical analysis will be discussed. Possible directions of new advances in the future will also be reviewed. Among subjects to be discussed are gas chromatography in the petroleum industry, new analytical methods in the electrical industry, the plastics industry, explosives, precious metals, foodstuffs and the pharmaceutical industry. There is to be a section on modern techniques and instrumentation covering automatic titration and the automatic recording of spectra in relation to industrial problems of analysis. The congress will aim to review the likely future developments in analytical chemistry. There will be an exhibition of apparatus.

Chemical Plant for Mexico

It is understood that the Montrose Chemical Corporation of California has negotiated through Nacional Financiera the formation of a subsidiary 'Montrose Mexicana, SA' with a capital of 40 million pesos. The new company will build a factory at Irapuato (State of Guanajuato) for the production annually of 8,000 tons of caustic soda, 7,000 tons of chlorine and 4,500 of DDT. Raw materials to be employed will be found in Mexico.

Threat to US Mining

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An extensive collection of selected powder samples will soon be 'on deposit' in SRI's newly established Particle Bank, the bulletin further relates. Operated by the Atmospheric Chemical Physics Section, the bank already contains various samples with known characteristics such as particle-size distribution and total surface. Samples of the powders on deposit will be available to university, industrial, and governmental laboratories for research purposes. Until now, there has been no organised source of such samples, thus necessitating costly and time-consuming preparation by laboratory personnel. SRI has established the bank on the premise that if such a central depository were created, the residue powders could be made available to other research groups for specific projects.

Key Industry Duty Exemptions

THE Treasury has issued Safeguarding of Industries (Exemption) No. 6. Order, 1956 which exempts from Key Industry Duty until 18 November 1956, (i) *p*-Acetamidophenol and phthalic anhydride (by a previous Order expiring, 18 August 1956), and (ii) continues until 18 February 1957, the exemption from Key Industry Duty of all other articles exempted from that duty by previous Orders which expire on 18 August 1956, with the following additions and deletions:—

Additions: Crotonaldehyde (aldehyde content calculated as crotonaldehyde not to exceed 94 per cent by weight), 2:6-dimethylheptan-4-ol, diphenyldichlorosilane, ethyl *n*-amyl ketone, ethyl -3:4-dihydroxyphenylpropionate, ethyl sodioacetoacetate. ethylene glycol monomethyl ether acetate, glycollic acid, mono-*n*-heptylamine, 3-mercaptopropane-1:2-diol, 3:2-mercurioxy-4-nitrotoluene, *mono*-3-methoxy-*n*-butyl alcohol, sebacic acid, *o*-tolidine.

Deletions: cerium oxide, 4-*tert*butylcatechol, *o*-cresol, ethylorthoformate, 1-naphthol, piperonylic acid, sorbitan *mono*laurate, sorbitan *mono*palmitate, sorbitan *mono*-stearate, sorbitan tristearate, theophylline, 2:4-xylenol.

Copies of the Order may be obtained (price 5d net, by post 7d) from HM Stationery Office, Kingsway, London WC2.

Italian Chemical Trade

IMPORTS of inorganic chemical products in the first six months of this year were 40,278 tons compared with 32,610 tons in the same period in 1955. Organic chemical products imports over this period totalled 31,017 tons, a decrease of 1,234 tons. Miscellaneous chemical products showed a marked increase, i.e., 82,174 tons compared with 62,600 tons in the first half of 1955. Exports of inorganic chemical products fell from 63,580 tons in the period January to June 1955 to 48,151 tons in the first half of this year. Exports of organic chemical products, however, rose from 24,313 tons to 29,346 tons and exports of miscellaneous chemical products increased from 160,480 tons to 177,744 tons.

German Oil Record

It is reported that German oil output last month exceeded 300,000 tons of crude for the first time. This corresponds to about 28 per cent of German requirements.

Commercial Intelligence

The following are taken from the printed reports, but we cannot be responsible for errors that may occur.

Change of Name

MIDLAND LABORATORY GUILD (1928) Ltd., King Alfred's Place, Broad Street, Birmingham, changed to Midland Laboratory Guild (1928) (Holdings) Ltd., on 28 June 1956.

New Registrations

BASF (United Kingdom) Ltd.

Private company. (570,319). Registered August 15. Capital £3,000 in £1 shares. Objects: To act as consultants and technical, commercial and financial advisers to persons engaged, whether as manufacturers or otherwise, in the chemical and dyeing industries and allied industries etc. The subscribers (each with one share) are: John W. M. Caine and John Richardson, both solicitors, of 11 Old Jewry, London EC2. The first directors are not named. Solicitors: Clifford Turner & Co., 11 Old Jewry, London EC2.

Cubrani Ltd.

Private company. (570,195). Registered 13 August: Capital £100 in £1 shares. Objects: To carry on the business of exporters, importers, manufacturers of and dealers in all kinds of minerals, ores, residues and scrap, chemicals and chemical products, etc. Subscribers (each with one share) are: Jack Glicksman, 87 Dalston Lane, London E8, accountant, and Leon Fox, 10 Leweston Place, London N16; merchant. The first directors are not named. Secretary: J. Glicksman. Registered office: 87 Dalston Lane, London E8.

Molecular Research & Development Co.

Private company. (570,357). Registered 15 August. Capital £100 in £1 shares. Objects: To carry on the business of manufacturing, analytical, research and general chemists and physicists etc. The subscribers (each with one share) are: Trevor W. Williams, solicitor's articled clerk, and Geoffrey M. Lewis, solicitor, both of 62 London Wall, London EC2. The first directors are to be appointed by the subscribers. Solicitors: Herbert Smith & Co., 62 London Wall, London EC2.

Organic Intermediates Ltd.

Private company (570,178). Registered 10 August. Capital £2,000 in £1 shares. Objects: To carry on the business of manufacturers and importers of and dealers in all types of chemicals and chemical products etc. Permanent directors are: Alan Brewer, 159 Queen Drive, Walton, Liverpool, and Merton I. Behrzman, 11 Cumberland Avenue, Liverpool. Secretary: Merton J. Behrzman. Reg. office: Lees Road, Kirkby Industrial Estate, near Liverpool.

Company News

Powell Duffryn Ltd.

Consolidated trading profits and other income for the year ended 31 March, after the various deductions etc., amount to £2,316,118 (£2,009,747 to which was added transfer from taxation reserves £25,000). Taxation requires £1,245,886 (£1,192,936), leaving consolidated net profit at £1,070,232 (£814,811). The directors recommended payment of a final dividend of 10 per cent actual (less tax) on the ordinary shares (making with the interim dividend of 6 per cent, 16 per cent for the year). The annual general meeting will be held on 19 September.

Explosions Injure Fourteen

Fourteen people, including two firemen, were injured when two explosions occurred at an Eccles chemical works last week. One man was seriously hurt by the first explosion, and firemen and workers were caught in the second as they arrived on the scene. The explosions, in the organic chemical plant at the Lankro Chemical Works, Salters Lane, occurred at lunch time when most of the workers were absent. Normally about forty would have been in the danger area. Most of the injuries were cuts and burns caused by flying glass and chemicals. The plant room was badly damaged, glass apparatus and metal piping being shattered.

Company Meeting

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chemical field which are generally not subject to the intense competition that the standard materials have to face.

Our research and engineering departments play an important part in this essential field, and through their efforts we are continually improving the performance of our plants by the extended use of mechanisation and instrumentation and the introduction of the latest types of automatic control. Only in this way can we absorb rising costs and preserve our competitive position in relation to the industries we serve.

Our research stations throughout the organisation also continue to make a valuable contribution to our progress in the development of new and improved processes.

Your group employs over 20,000 men and women, and to them all I should like to express our thanks for their efforts and enthusiasm during the past year.

Trading results in the current year are so far encouraging. The operation of the 'credit squeeze' and other measures introduced by the Government to combat inflation may well be expected to bring about some contraction in the home demand which, temporarily at any rate, might effect the volume of our business. On the other hand, our operations are on a broad basis, both in the UK and overseas, and I therefore feel reasonably confident that we can anticipate satisfactory results for the current year.

Flameproof Loudspeaker

GEC LTD. announces that its new loudspeaker horn driving unit for use in inflammable atmospheres has been granted the Ministry of Fuel and Power's Group I certificate (FLP 3704) approving its use in mines in addition to its certificate (FLP 3569/1) for Groups II and III of BS 229/1946. First of its kind to be officially approved, the unit provides loud, intelligible speech in the coal mining, oil, paint and chemical industries, for example, where broadcasting was previously impossible due to the risk of fire.

It is designed for use with a projector horn or any well-designed re-entrant horn having a minimum air column length of 20 in. The speech coil, driver section, magnet assembly and line matching transformer are enclosed in an aluminium alloy flameproof case.

Stocks & Shares

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Boake Roberts 5s shares were maintained at 14s, while in other directions, Yorkshire Dyeware & Chemical 5s shares remained at 9s 3d. Coalite & Chemical 2s shares at 4s 1½d have also been well maintained. British Chrome Chemicals 5s shares were 10s and Ashe Chemical 1s shares changed hands around par. F. W. Berk were 7s 4½d. British Xylonite declined on the month from 26s to 25s 6d, while British Industrial Plastics 2s shares have been maintained at 5s.

There was again outstanding activity and strength in shares of Borax Holdings, which compared with a month ago have advanced further from £13 5/16 to £14¾ and have touched £15¼ due to steady buying by British and US investors on higher dividend expectations and free scrip issue hopes.

Elsewhere compared with a month ago, Unilever have reacted to 76s 9d. United Molasses, after declining, rallied to 51s 9d and were helped by the scrip bonus news. Boots Drug 5s shares eased from 15s to 14s 6d. Among oils the Egyptian trouble caused heavy declines. Shell have declined on the month from 163s 1½d to 150s 7½d and BP from 174s 4½d to 157s 6d.

Purchasing Officers' Meeting

AT SCARBOROUGH from 27 to 30 September the Purchasing Officers' Association is holding its annual conference and exhibition. Among the speakers will be Mr. W. A. M. Edwards, purchases controller of ICI Ltd. (Price Aspect of Purchasing); Mr. T. B. Henderson, director of Brandeis, Goldschmidt & Co. Ltd. (Copper) and Mr. H. C. Hawkins, president of the Combustion Engineering Association (Oil).

The Association has published its triennial list of members. Copies of the list (10s 6d) may be obtained from the head office, Wardrobe Court, 146a Queen Victoria Street, London EC4.

Development At Hartlepool

Extensions to Pallister (Hartlepool) works, of the Steetley Magnesite Co. Ltd., which are expected to increase the output of refractory magnesite by about 40 per cent, may be completed in 12 month's time. The extensions are said to be costing £1¼ million. Another £250,000 is being spent at the firm's plant at Thrislington.

CLASSIFIED ADVERTISEMENTS

EDUCATIONAL

UNIVERSITY OF MANCHESTER
THE NEXT SESSION COMMENCES ON THURSDAY, OCTOBER 4TH, 1956.

SITUATIONS VACANT

A Development **CHEMIST OR CHEMICAL ENGINEER** is required by a firm of chemical manufacturers in **SOUTH LANCASHIRE** to be responsible to Technical Manager for research and development of new products. A degree in chemistry or chemical engineering, or equivalent qualification essential; previous experience of laboratory and plant scale work an advantage. Good prospects of promotion for a man with initiative and ability to work in close contact with management at all levels.

A staff superannuation scheme is in operation, and there are good canteen facilities. Assistance may be given to obtain suitable accommodation. The successful applicant will be required to enter into a short term service agreement. A salary of up to £900 per annum will be paid to the right man, according to age and qualifications.

Applications in confidence, with details of age, qualifications and experience to **BOX NO. C.A. 3492, THE CHEMICAL AGE, 154, FLEET STREET, LONDON, E.C.4.**

ION-EXCHANGE MEMBRANES. A long-term investigation of the industrial applications of these materials is commencing shortly. A team of **ORGANIC CHEMISTS, PHYSICAL CHEMISTS** and **CHEMICAL ENGINEERS** is being formed, but several vacancies for these still exist. Posts are permanent and pensionable. Assistance given in finding local accommodation. Write for application form to Sondes Place Research Institute, Dorking, Surrey.

MECHANICAL ENGINEER
COURTAULDS, LIMITED,
Chemicals Division,
requires a
GRADUATE (or qualified) **MECHANICAL ENGINEER** for its large chemical manufacturing plant near Manchester. In addition to the day-to-day manufacture of heavy chemicals (which offers a great variety of work) there is also scope for investigational and development work on the design of new plant and on the maintenance side of works engineering. In short, the work combines traditional workshop practice with an original approach to new problems and requires an absence of professional prejudice. It also provides opportunities for a man to follow his own work through to the final fruition of commissioning and operation. Previous industrial experience is desirable but a new graduate would be considered if he has had practical vacation experience. The post is pensionable and the occupant will be eligible for the Company's Co-partnership Scheme.

Candidates should write for a detailed form of application to
DIRECTOR OF PERSONNEL,
COURTAULDS, LIMITED,
16, ST. MARTINS-LE-GRAND,
LONDON, E.C.1,
quoting reference number H.13.

BICC

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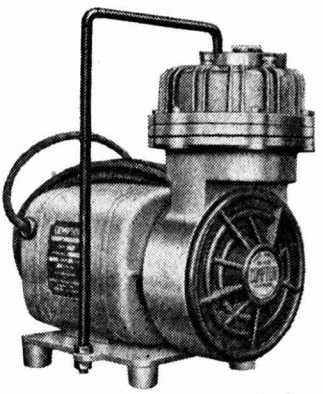

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